Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

CENTRAL MACHINERY®

9 HP RIDE-ON TRENCHER

WARNING!
IMPORTANT INFORMATION

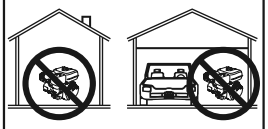
The Hitch Coupler MUST be properly secured to the hitch ball of the towing vehicle. After assembly and attachment, pull up and down on the Hitch Coupler to make sure the hitch ball is fitting snugly in the Hitch Coupler. **There must be no play between the hitch ball and Hitch Coupler.** If there is play, tighten the Adjustment Nut until no play is present. If the Adjustment Nut is too tight, the Handle will not lock. **Carefully read and follow the complete instructions in this manual BEFORE setup or use.**

If the Coupler is not secured properly, the ball could come loose while the Trencher is in motion, possibly causing property damage, SERIOUS PERSONAL INJURY, or DEATH.

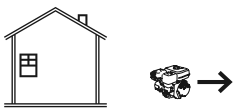
⚠ DANGER

Using an engine indoors CAN KILL YOU IN MINUTES.

Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.



NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

Visit our website at: http://www.harborfreight.com
Email our technical support at: productsupport@harborfreight.com

ITEM 62365

REV 14j

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

Copyright© 2014 by Harbor Freight Tools®. All rights reserved.
No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools.
Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

⚠ WARNING

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

Table of Contents

Specifications 2
Safety 3
Setup 6
Operation 10
Maintenance 17
Troubleshooting 22
Warranties 24
Parts Lists and Diagrams 26

SAFETY

SETUP

OPERATION

MAINTENANCE

Specifications

Displacement		301cc
Engine Type		Horizontal Single Cylinder 4-stroke, OHV, 9HP, Recoil Start
Engine Family		ECRPS.3012GA
Cooling System		Forced air cooled
Fuel	Type	87+ octane unleaded gasoline
	Capacity	1.72 Gallon
Engine Oil	Type SAE	10W-30 above 32° F 5W-30 at 32° F or below
	Capacity	1 Quart
Run Time @ 50% Load with full tank		3 hours
Sound Level		106 dB
Bore x Stroke		80 mm x 60 mm
Compression Ratio		8.2:1
Rotation viewed from PTO (power takeoff - the output shaft)		Counterclockwise
Shaft	Shaft	1″ x 3.48″
	Keyway	1/4″ (6.3 mm)
	End Tapped	7/16 - 20
Spark Plug	Type	F6TC (Torch)
	Gap	0.7 - 0.8 mm
Valve Clearance	Intake	0.15 ± 0.02 mm
	Exhaust	0.20 ± 0.02 mm
Speed	Idle	1,740± 50 RPM
	Maximum	3,600 RPM
Battery Required		12V 18Ah
Hydraulic Oil		3.5 Gallons
Tire Inflation		65 PSI
Digging Depth		5-1/2 and 7 Feet Deep
Maximum Digging Reach		8 Feet
Spool Valve		Rated 10.6 GPM
Pump		Rated 2.7 GPM
Boom Travel		60° Left/Right
Bucket Load Capacity		1.24 Cubic Feet
Hitch Ball size		1-7/8" Diameter

The emissions control system for this Engine is warranted for standards set by the U.S. Environmental Protection Agency and by the California Air Resources Board (also known as CARB). For warranty information, refer to the last pages of this manual.

WARNING SYMBOLS AND DEFINITIONS	
⚠	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE CAUTION	Addresses practices not related to personal injury.

Symbol Definitions

Symbol	Property or Statement
RPM	Revolutions Per Minute
HP	Horsepower
	WARNING marking concerning Risk of Eye Injury. Wear ANSI-approved safety goggles with side shields.
	Read the manual before set-up and/or use.
	WARNING marking concerning Risk of Hearing Loss. Wear hearing protection.

Symbol	Property or Statement
	WARNING marking concerning Risk of Respiratory Injury. Operate engine OUTSIDE and far away from windows, doors, and vents.
	WARNING marking concerning Risk of Fire while handling fuel. Do not smoke while handling fuel.
	WARNING marking concerning Risk of Fire. Do not refuel while operating. Keep flammable objects away from engine.

IMPORTANT SAFETY INSTRUCTIONS

WARNING! Read all instructions.
Failure to follow all instructions listed below may result in fire, serious injury and/or DEATH.
The warnings and precautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

Set up Precautions

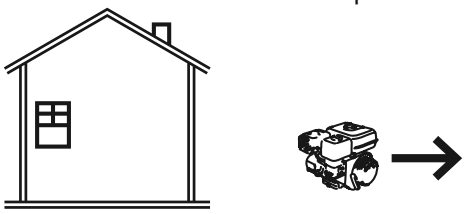
1. Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store fuel or other flammable materials nearby.
2. Have multiple ABC class fire extinguishers nearby.
3. This equipment has a spark arresting muffler included. A spark arresting muffler is required by law in California, on some US Forest Service land, and possibly in other areas or situations.
4. Set up and use only on a flat, level, well-ventilated surface.
5. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during set up.
6. Use only lubricants and fuel recommended in the Specifications chart of this manual.

Operating Precautions

1.

CARBON MONOXIDE HAZARD
Using an engine indoors
CAN KILL YOU IN MINUTES.
Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.

NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

2. Contact local utility companies before beginning any project. Buried utility lines may not be marked and, if struck, can cause SERIOUS PERSONAL INJURY or DEATH.
3. Keep children away from the equipment, especially while it is operating.
4. Keep all spectators at least 20 feet from the equipment during operation.
5. Fire Hazard! Do not fill fuel tank while engine is running. Do not operate if gasoline has been spilled. Clean spilled gasoline before starting engine. Do not operate near pilot light or open flame.
6. Do not touch engine during use. Let engine cool down after use.
7. Never store fuel or other flammable materials near the engine.
8. Industrial applications must follow OSHA requirements.
9. Do not leave the equipment unattended when it is running. Turn off the equipment (and remove safety keys, if available) before leaving the work area.
10. The equipment can produce high noise levels. Prolonged exposure to noise levels above 85 dBA is hazardous to hearing. Wear ear protection when operating the equipment or when working nearby while it is operating.
11. Wear ANSI-approved safety goggles and hearing protection during use.
12. Do not operate in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Gasoline-powered engines may ignite the dust or fumes.
13. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to a heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near the engine's magneto or recoil starter.
14. Use only accessories that are recommended by Harbor Freight Tools for your model. Accessories that may be suitable for one piece of equipment may become hazardous when used on another piece of equipment.
15. Stay alert, watch what you are doing and use common sense when operating this piece of equipment. Do not use while tired or under the influence of drugs, alcohol or medication.
16. Do not overreach. Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.
17. Use this equipment with both hands only. Using equipment with only one hand can easily result in loss of control.
18. Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.
19. Parts, especially exhaust system components, get very hot during use. Stay clear of hot parts.
20. Do not cover the engine or equipment during operation.
21. Keep the equipment, engine, and surrounding area clean at all times.
22. Use the equipment, accessories, etc., in accordance with these instructions and in the manner intended for the particular type of equipment, taking into account the working conditions and the work to be performed. Use of the equipment for operations different from those intended could result in a hazardous situation.
23. Do not operate the equipment with known leaks in the engine's fuel system.
24. WARNING: Some dust created by power sanding, sawing, grinding, drilling, and other construction activities, contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Some examples of these chemicals are:
    - Lead from lead-based paints
    - Crystalline silica from bricks and cement or other masonry products
    - Arsenic and chromium from chemically treated lumber

    Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles. (California Health & Safety Code § 25249.5, *et seq.*)

Operating Precautions (cont.)

25. WARNING: This product contains or, when used, produces a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. (California Health & Safety Code § 25249.5, *et seq.*)
26. WARNING: This product contains di (2-ethylhexyl) phthalate (DEHP), a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. (California Health & Safety Code § 25249.5, *et seq.*)
27. Never place your hands or body near a hydraulic fluid leak. High-pressure fluid can be forced under the skin resulting in serious injury.
28. When spills of fuel or oil occur, they must be cleaned up immediately. Dispose of fluids and cleaning materials as per any local, state, or federal codes and regulations. Store oil rags in a bottom-ventilated, covered, metal container.
29. Keep hands and feet away from moving parts. Do not reach over or across equipment while operating.
30. Before use, check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the equipment's operation. **If damaged, have the equipment serviced before using.** Many accidents are caused by poorly maintained equipment.
31. Use the correct equipment for the application. Do not modify the equipment and do not use the equipment for a purpose for which it is not intended.

Transport Precautions

1. Only use a suitable means of transport and lifting devices with sufficient weight bearing capacity when transporting the equipment.
2. Properly secure the equipment to transport vehicle to prevent it from rolling, slipping, and tilting.
3. Always make sure the hitch coupler is securely fixed to the vehicle before moving it. If the Coupler is not secured properly, the link could come loose while the trailer is in motion, possibly causing property damage, SERIOUS PERSONAL INJURY, or DEATH.
4. Do not exceed 30 MPH when towing the Trencher.
5. Do not tow the Trencher on roads or highways. This product is not D.O.T. compliant, and is not road legal.

Service Precautions

1. **Before service, maintenance, or cleaning:**
   a. **Turn the engine switch to its "OFF" position.**
   b. **Allow the engine to completely cool.**
   c. **Then, remove the spark plug wire from the spark plug.**
2. Keep all safety guards in place and in proper working order. Safety guards include muffler, air cleaner, mechanical guards, and heat shields, among other guards.
3. **Do not alter or adjust any part of the equipment or its engine that is sealed by the manufacturer or distributor. Only a qualified service technician may adjust parts that may increase or decrease governed engine speed.**
4. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during service.
5. Do not allow the hydraulic hose to come in contact with any hot part of the unit. The hose might be damaged, possibly causing it to burst or leak under high pressure.
6. Maintain labels and nameplates on the equipment. These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
7. Have the equipment serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the equipment is maintained. Do not attempt any service or maintenance procedures not explained in this manual or any procedures that you are uncertain about your ability to perform safely or correctly.
8. Store equipment out of the reach of children.
9. Follow scheduled engine and equipment maintenance.

Refueling:

1. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refuelling.
2. Do not refill the fuel tank while the engine is running or hot.
3. Refuel in a well-ventilated area only.
4. Wipe up any spilled fuel and allow excess to evaporate before starting engine. **To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.**

SAVE THESE INSTRUCTIONS.

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

⚠WARNING

RISK OF ACCIDENTAL STARTING RESULTING IN SERIOUS PERSONAL INJURY.
Turn the Power Switch of the equipment to its "OFF" position, wait for the engine to cool, and unplug the spark plug wire(s) before assembling or making any adjustments to the equipment.

The emission control system for this product's Engine is warranted for standards set by the U.S. Environmental Protection Agency and by the California Air Resources Board (also known as CARB). For warranty information, refer to the last pages of this manual.

At high altitudes, the engine's carburetor, governor (if so equipped), and any other parts that control the fuel-air ratio will need to be adjusted by a qualified mechanic to allow efficient high-altitude use and to prevent damage to the engine and any other devices used with this product.

Assembly

1. This equipment has a spark arresting muffler. A spark arresting muffler is required by law in California, on some US Forest Service land, and possibly in other areas or situations.
2. Due to the size of the Trencher and its components, assistance may be required during the entire assembly process.
3. Use jacks (not included) to evenly raise the Frame Assembly (90) & support with jack stands (not included).
4. Mount both Axles (50) near the boom end of the Frame and secure with Lock Pins (82).
5. Place a Tire (52) over the four studs on each Hub. Secure the Tires to the Hubs, using four Lug Nuts (53) per Tire. The Lug Nuts must be snug. Inflate the Tires to 65 PSI.
6. Slightly raise the jacks, remove the jack stands, then lower the jacks. Block the Tires and tighten the Lug Nuts to at least 90 Ft-Lbs.
7. Attach Seat (73) to the Seat Bottom Plate (10) and secure both Seat and Plate to the post on top of Hydraulic Oil Tank.
8. Attach the Control Support (3) to the Frame Assembly (90) using four Hex Bolts (81).

NOTE: The Hydraulics of this unit are tested before shipment. There may be hydraulic fluid present in components. Assemble the unit in an area that will not be damaged by leaking hydraulic fluid. It is recommended that you wrap rags securely over the Hydraulic Connectors on all the Cylinders during assembly. Wear splash-resistant ANSI approved safety goggles and other protective gear to prevent injury from leaking fluid.

9. Attach the Main Boom (36) to the Boom Pivot (38) using the Pin (42) through the bottom hole and Clevis Pin No. 1 (29) through the upper hole. Secure both pins with Hair Pin Clip (31); Pin (42) requires one Cotter pin on each end. See Figure A.

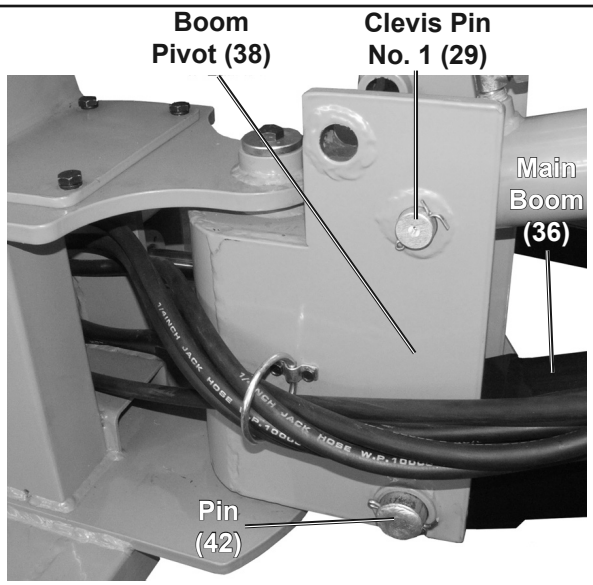


Figure A

10. Mount the Boom Extension (34) to the Main Boom (36) using the Pin (42), left, and Clevis Pin No. 1 (29), top. Secure both pins with Hair Pin Clip (31).
11. Attach the Hitch Coupler (58) to the Frame Assembly (90) under the Engine (74) using Hex Bolts (75) and Hex HD. Bolt (72).
12. Connect, tighten, and check all hydraulic hose fittings to the proper connections, as shown in the Hose Connection Diagram. Hoses and fittings are numbered. Tighten all fittings.
13. Open the Hydraulic Fluid Fill Plug (11). Top off the Hydraulic Fluid Reservoir with high quality hydraulic fluid. Check that the fluid level is between the lines on the attached Dipstick. Close the Hydraulic Fluid Fill Plug securely.

Attaching the Leg Assembly

1. To use the Trencher, the Leg Assemblies must be installed next to the Boom (36), and the Wheels and Axles (50) moved to the rear.
2. Move the Trencher to the work area (See Starting the Engine on page 10).
3. Start the engine and use the Boom Controls to curl the Bucket toward the Boom without touching the ground. Moving the Bucket Assembly (32) down to the ground will raise the Frame Assembly (90). Lift the Tires just off the ground and stop.
4. Ensure the controls will not be touched or bumped, and that the Trencher will remain motionless. Never place any part of your body under the Trencher.
5. With the Tires (52) off the ground, remove the Wheel and Axle (50) to the operator's left and replace with the left side Extension Leg (19) and Leg Assembly (24). Direct the Extension Leg so it turns toward the Bucket end of the Trencher. Secure with Lock Pin No. 2 (82). Repeat procedure for the right side. Raise Bucket Assembly again to lower onto Leg Assembly, and turn Engine off.
6. Using a jack and jack stands (not included), raise up the engine end of the Trencher and disconnect from the Towing Hitch. Slide the Wheels and Axles (50) into the engine end of the Frame (90). Secure each Axle with Lock Pin No. 2 (82).

Purging the Cylinder

1. Remove all Safety Locking Pins (15), disengage the Safety Latch (41) and loosen Hydraulic Tank Fill Plug (11).
2. Press forward on the Boom Swing Lever (located on Control Panel (9) until the Boom stops moving, then pull back on it until it moves in the other direction. Center the Boom.
3. Press forward on the Main Boom Lever until the Main Boom is fully raised. Then, press Forward on the Boom Extension Lever until the Boom is fully extended.
4. Press forward on the Bucket Lever until the Bucket is fully extended. Pull back on the Lever to retract it fully.
5. Pull back on the Boom Extension Lever until the Boom is pulled back all the way. Pull back on the Main Boom Lever until the Main Boom is lowered completely.
6. Adjust the Boom back to its rest position and replace all locking devices.
7. Shut off the Engine, check the Hydraulic Fluid level and refill as necessary.

Note: The Fill Plug is vented. When tightening the Fill Plug, tighten it securely then back it off slightly.

Components and Controls

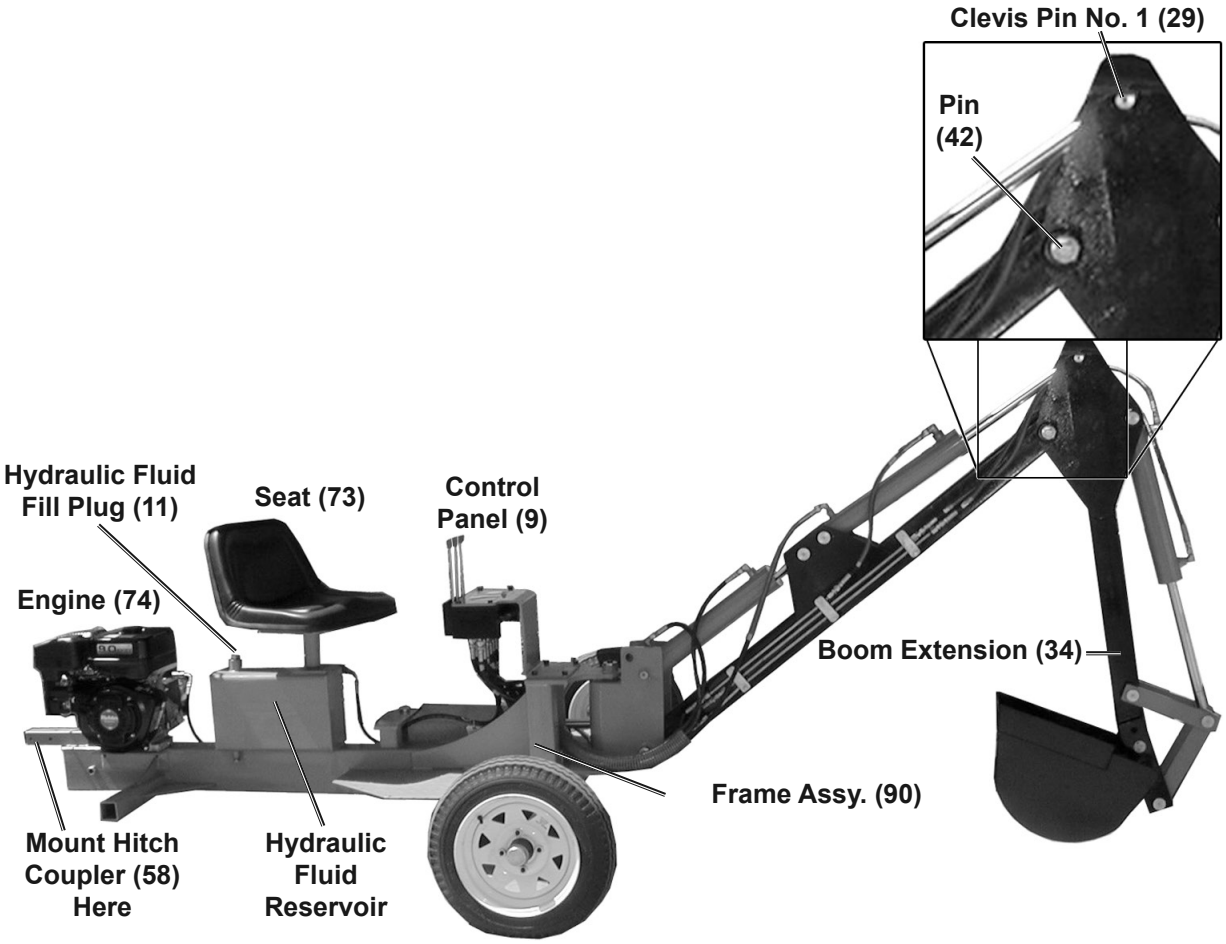


Figure B: Tow Configuration

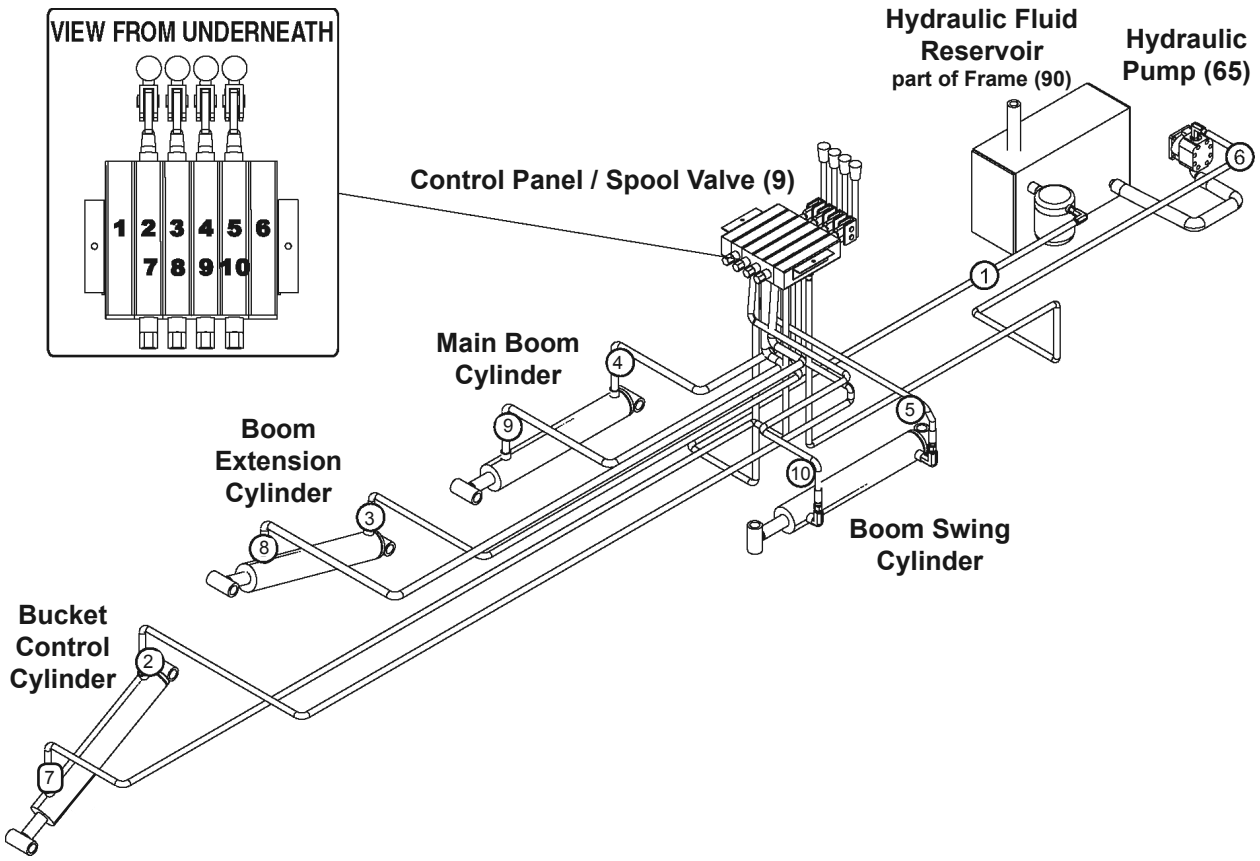

VIEW FROM UNDERNEATH
1 2 3 4 5 6
7 8 9 10
Hydraulic Fluid Reservoir part of Frame (90)
Hydraulic Pump (65)
Control Panel / Spool Valve (9)
Main Boom Cylinder
Boom Extension Cylinder
Boom Swing Cylinder
Bucket Control Cylinder

Figure C: Hose Connection

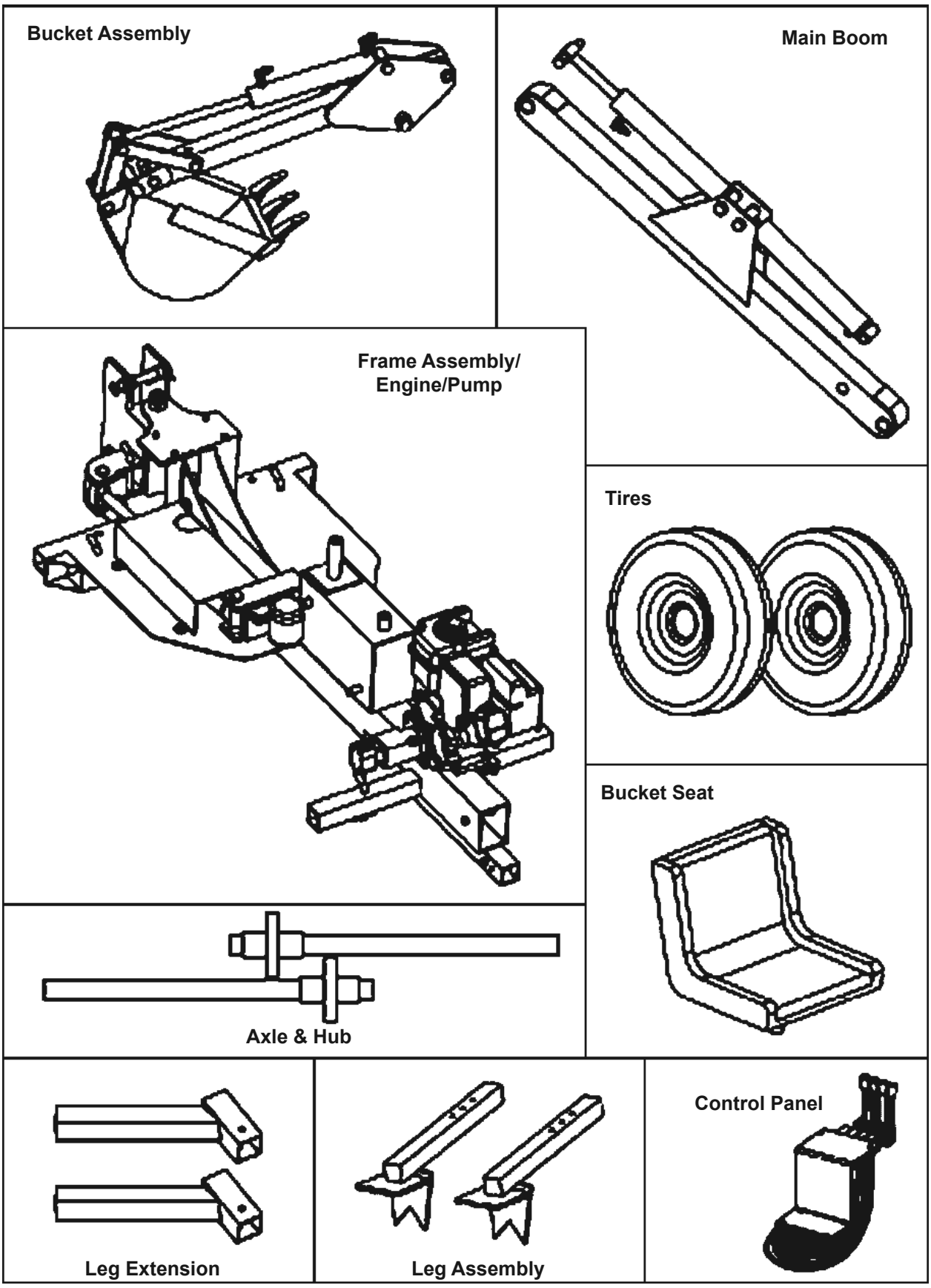

Bucket Assembly
Main Boom
Frame Assembly/
Engine/Pump
Tires
Bucket Seat
Axle & Hub
Leg Extension
Leg Assembly
Control Panel

Figure D

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Pre-Start Checks

Inspect engine and equipment looking for damaged, loose, and missing parts before set up and starting.
If any problems are found, do not use equipment until fixed properly.

Checking and Filling Engine Oil

NOTICE: Your Warranty is VOID if the engine's crankcase is not properly filled with oil before each use. Before each use, check the oil level. Do not run the engine with low or no engine oil. Running the engine with no or low engine oil WILL permanently damage the engine.

1. Clean the Oil Filler Cap and the area around it.
2. Remove the Oil Filler Cap/Dipstick. Read the engine service manual for the proper way to check the oil level.
3. If the oil level is low, add the proper type and weight. See information below.
   Oil type:
   32° F or above = SAE 10W-30
   Below 32° F = SAE 5W-30.
4. Replace the Oil Filler Cap.

NOTICE: Do not run the engine with too little oil. The engine will be permanently damaged.

Checking and Filling Fuel

WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Fill the fuel tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.

1. Clean the Fuel Cap and the area around it.
2. Unscrew and remove the Fuel Cap.
3. Remove the Strainer and remove any dirt and debris. Then replace the Strainer.

Note: Do not use gasoline containing more than 10% ethanol (E10). Do not use E85 ethanol. Add fuel stabilizer to the gasoline or the Warranty is VOID.

Note: Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the carburetor, affecting engine performance and/or causing damage.

4. If needed, fill the Fuel Tank to about 1 inch under the fill neck of the Fuel Tank with 90 octane or higher unleaded gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use.
5. Then replace the Fuel Cap.
6. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.

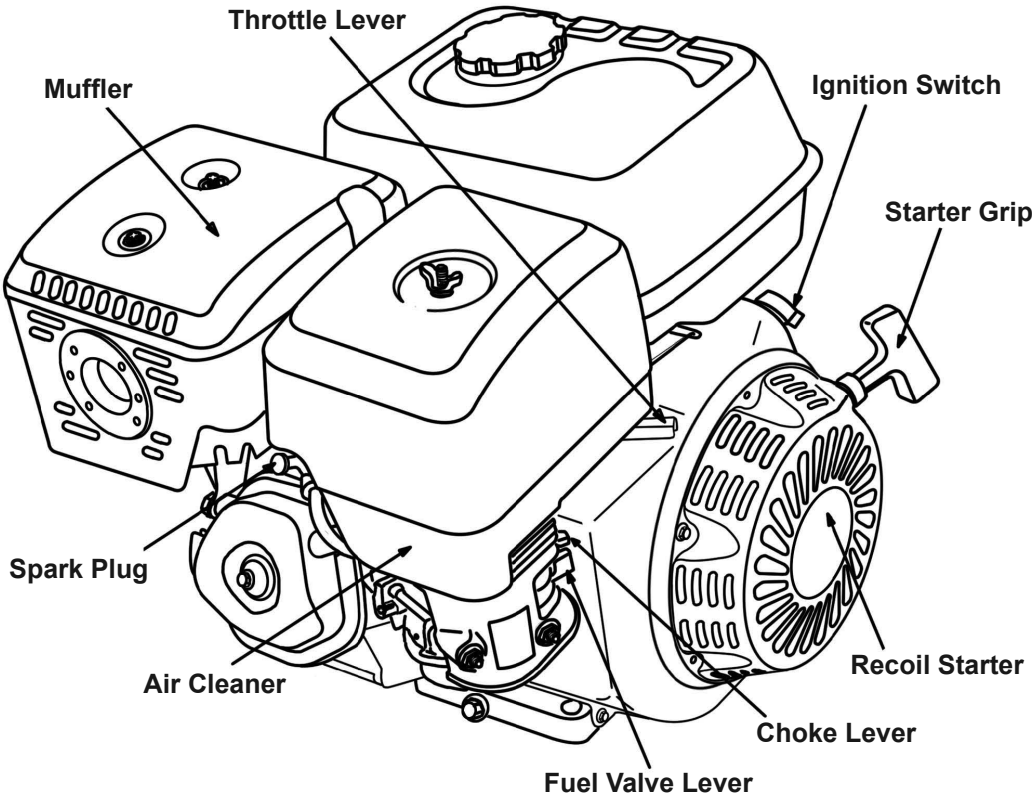
Starting the Engine

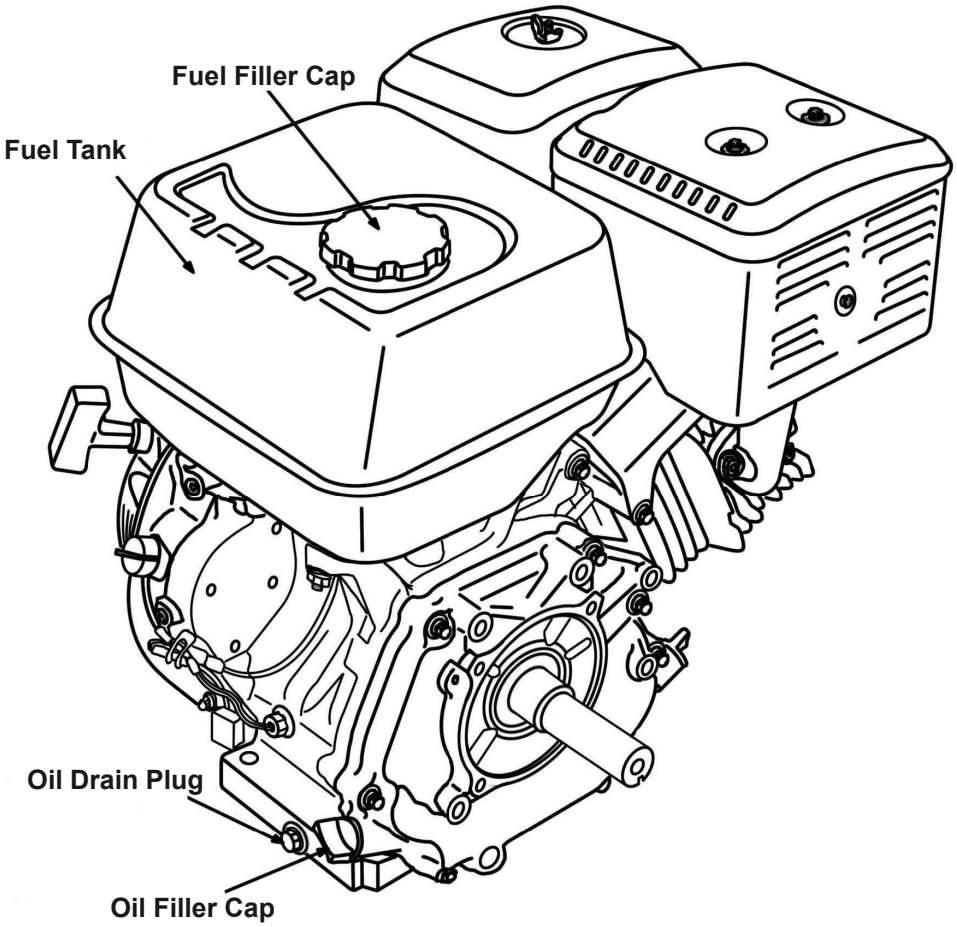
Before Starting the Engine

Before starting the engine:

a. **Follow the Set Up Instructions to prepare the equipment.**
b. **Inspect the equipment and engine.**
c. **Fill the engine with the proper amount and type of both unleaded gasoline and oil.**
d. **Read the Equipment Operation section that follows.**

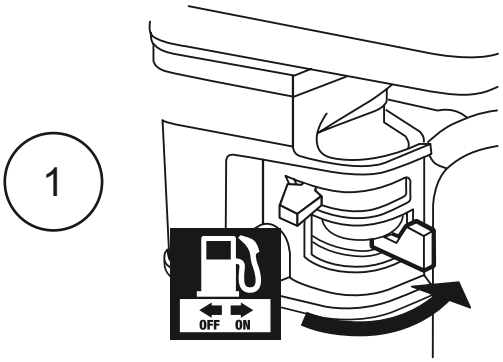
Engine Diagrams



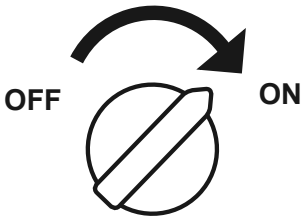


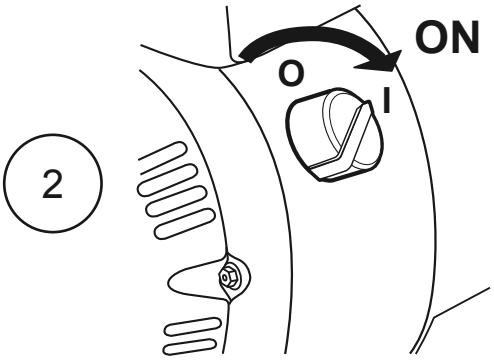
Manual Start

1. Turn the Fuel Valve Lever to its “OPEN” position.

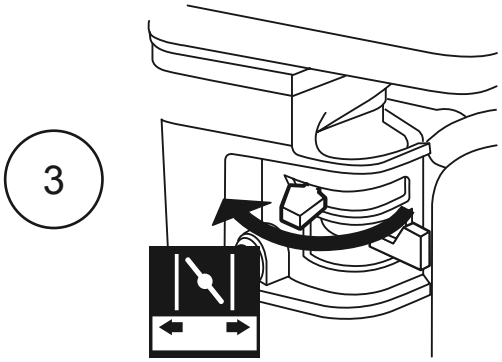


2. Turn the Ignition Switch to its ON or RUN position.



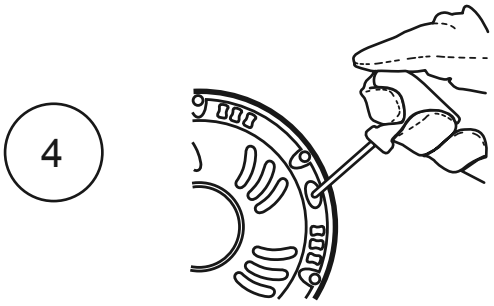


3. Then, turn the engine Choke Lever to its “START” position. Set the Choke Lever in the “RUN” position when starting a warm engine.



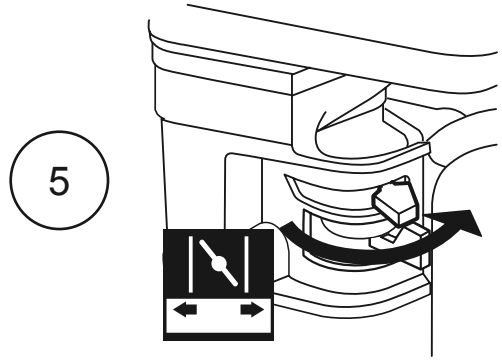
4. Grip the Starter Handle of the Engine loosely and pull it slowly several times to allow the gasoline to flow into the Engine’s carburetor. Then pull the Starter Handle gently until resistance is felt. Allow Cable to retract fully and then pull it quickly. Repeat until the engine starts.

Note: Do not let the Starter Handle snap back against the engine. Hold it as it recoils so it doesn’t hit the engine.



5. Allow the Engine to run for several seconds. Then, if the Choke Lever is in the CHOKE position, move the Choke Lever very slowly to its RUN position.

Note: Moving the Choke Lever too fast could stall the engine.



6. Slide the Throttle or Speed Control Lever to 1/3 away from the SLOW position (the “turtle”). Adjust as needed.

Note: Some tools have a Speed Control Lever located elsewhere on the tool which functions the same as the Throttle. Use the Speed Control Lever in place of the Throttle when the tool is so equipped.

IMPORTANT: Allow the engine to run at no load for five minutes after each start-up so that the engine can stabilize.

Break-in Period:

a. Breaking-in the engine will help to ensure proper equipment and engine operation.

b. The operational break-in period will last about 3 hours of use. During this period:
   - Do not apply a heavy load to the equipment.
   - Do not operate the engine at its maximum speed.

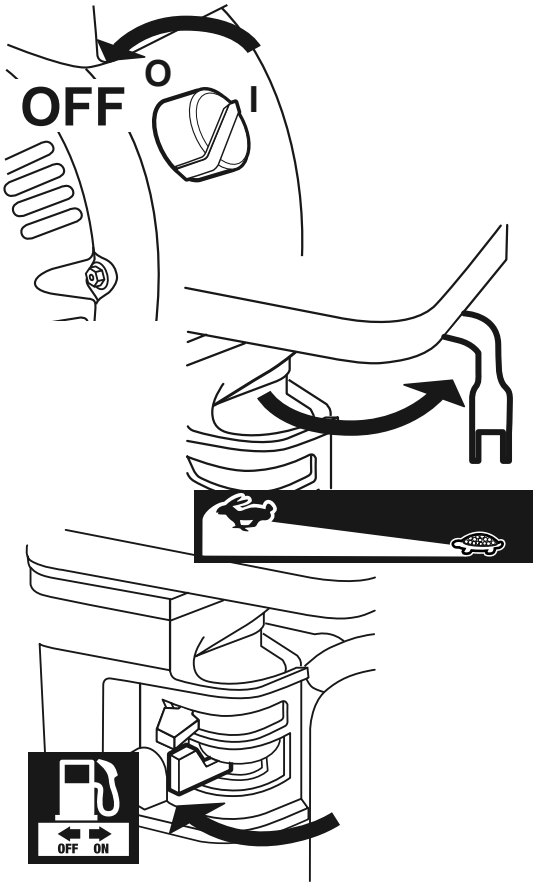
c. The maintenance break-in period will last about 20 hours of use.
   - Change the engine oil after this period.

Under normal operating conditions subsequent maintenance follows the schedule explained in the MAINTENANCE section.

Stopping the Engine

1. To stop the engine in an emergency, turn the Engine Switch off.

2. Under normal conditions, use the following procedure:
   a. Turn the Engine Switch off.
   b. Close the Fuel Valve.



NOTICE
See “Long-Term Storage” on page 15 for complete storage instructions.

Changing Trencher Arm Positions

This Trencher can be used with two arm positions. See Figure E and Figure F.

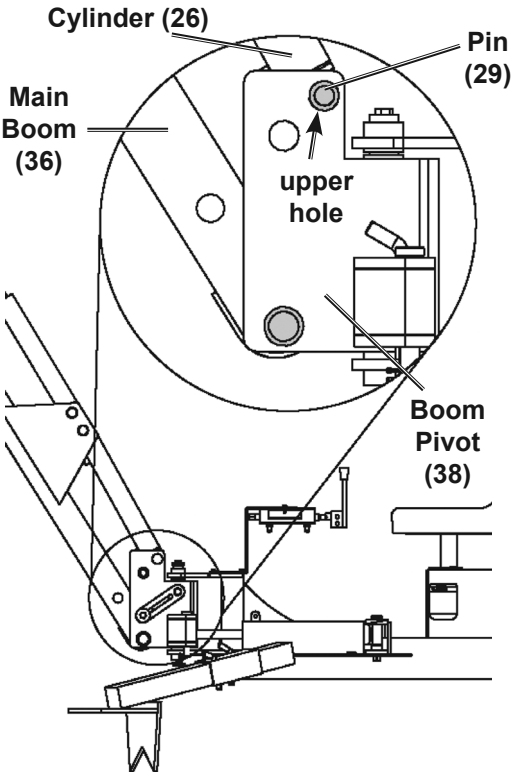


Figure E: Shallow Position (5 1/2' downward reach)

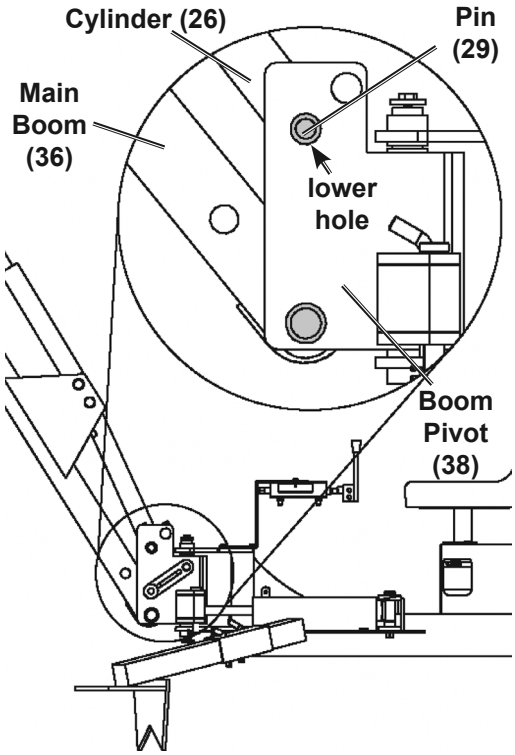


Figure F: Deep Position (7' downward reach)

1. To use the Shallow Position, with a 5 1/2' downward reach, do as follows:
   a. While the end of the Boom is supported, remove the Pin (29).
   b. Align the Cylinder with the upper hole.
   c. Insert the Pin (29), and secure it with the Hair Pin Clip (31).

2. To use the Deep Position, with a 7' downward reach, do as follows:
   a. While the end of the Boom is supported, remove the Pin (29).
   b. Align the Cylinder with the lower hole.
   c. Insert the Pin (29), and secure it with the Hair Pin Clip (31).

General Operating Instructions

1. With the Engine running, sit in the Operator Seat (73) and pull the Boom Lever control backward to raise the Main Boom (36). See Figure G.

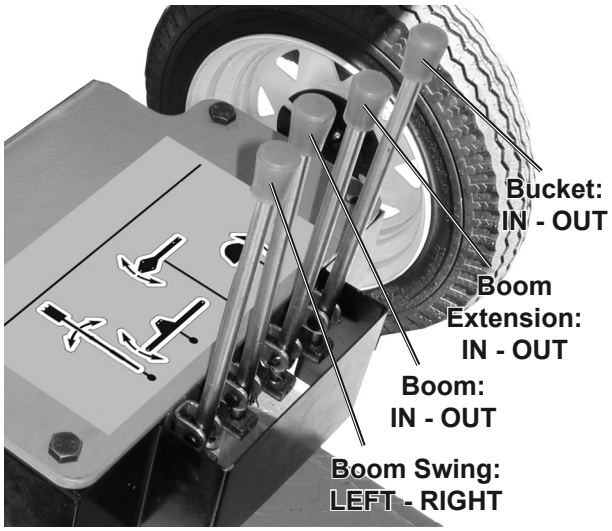


Figure G: Operate controls by pushing in or pulling out.

2. Pull back on the Boom Extension Handle Control to raise the Boom Extension (34).
3. Push forward on the Bucket Handle Control to open the Bucket Assembly (32).
4. Push forward on the Boom Handle to lower the Boom until the Bucket reaches the ground.
5. Pull back on the Bucket Lever control until the Bucket scoops up the dirt.
6. Pull back on both the Boom and Boom Extension Control Levers to raise the load.
7. Press in, or push out, the Boom Swing Control Levers to move the Bucket left or right.

Note: The Boom's travel is 60 degrees left and 60 degrees right.

8. Press in on the Bucket control handle to dump the load.

Moving the Trencher

1. One method for moving the Trencher around the work area is by using the Boom to push the Trencher across the ground.

⚠**WARNING!** This technique can be difficult to control and should only be attempted by an experienced operator. The stability of the Trencher is dependent on the stability of the ground; if you choose to move the Trencher in this way, do so at your own risk. Do not use the Trencher near ditches or drop-offs.

2. Swing the Bucket inward so that the front of the Bucket, not the scoop, is facing downward. Press the Bucket down onto a solid piece of ground and press down hard enough to raise the front legs off the ground.
3. Carefully operate the controls to move the Boom and slowly roll yourself in the desired direction. Be certain that the Tires and the new resting places for the Legs all remain on solid, stable ground.
4. After you have repositioned the Trencher, raise the Boom to lower the Outriggers back onto the ground. The procedure can be repeated to move farther.

Transporting the Trencher

1. Lock the Boom in Place. Use the Bucket Lever to line the hole on the Bucket (32) up with the hole on the Boom Extension (34). Insert a Safety Locking Pin (15) and secure with a Ball Pin.
2. Use the Boom Swing Lever to line up the hole in the Boom Pivot (38) with the Hole in the Frame (90). Insert a Safety Locking Pin (15) and secure with a Ball Pin. See Figure H.

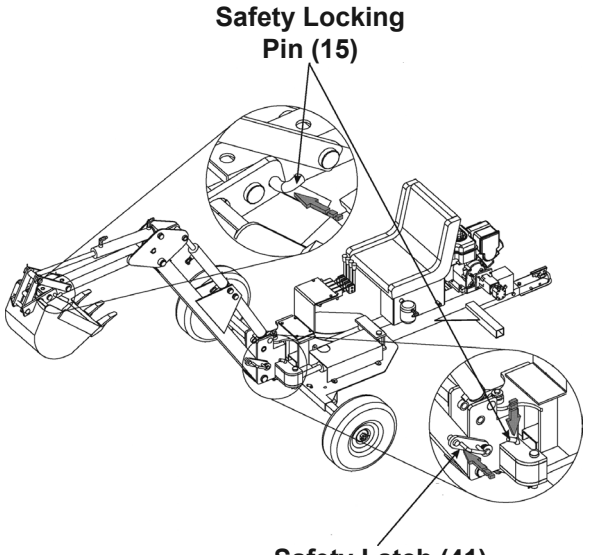


Figure H

3. Put the Boom into the Shallow Position and raise it until the Pin on the side of the Main Boom (36) is close enough for the Safety Latch (41) to swing over it. To use the Safety Latch, pull out on the handle, swing it over the Pin, and lower it over the Pin, locking it in place.
4. When transporting the Trencher, make sure your hitch (not included) is compatible with the Hitch Coupler (92). Follow all of the safety warnings for towing in your vehicle's manual. The Hitch Coupler will only accept a 2 inch hitch ball.
5. To reduce friction between the hitch ball and Hitch Coupler (58), apply a layer of heavy-weight grease over the hitch ball.
6. Temporarily remove the "R" Pin and Safety Pin. Then, pull up on the Trigger and lift up on the Handle. See Figure I.

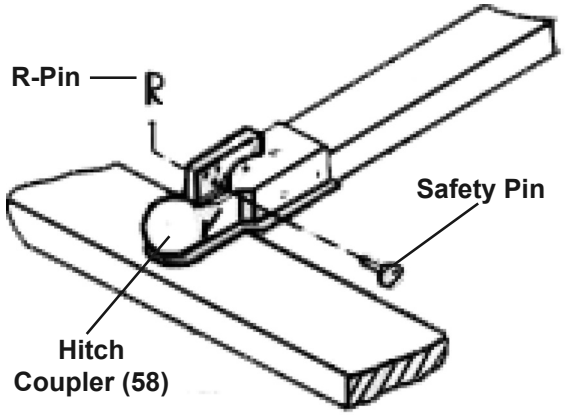


Figure I

7. Place the Hitch Coupler (58) over the vehicle's hitch ball, pull the trigger, push down on the Handle, and release the Trigger, making sure it locks in the slot. See Figure J.

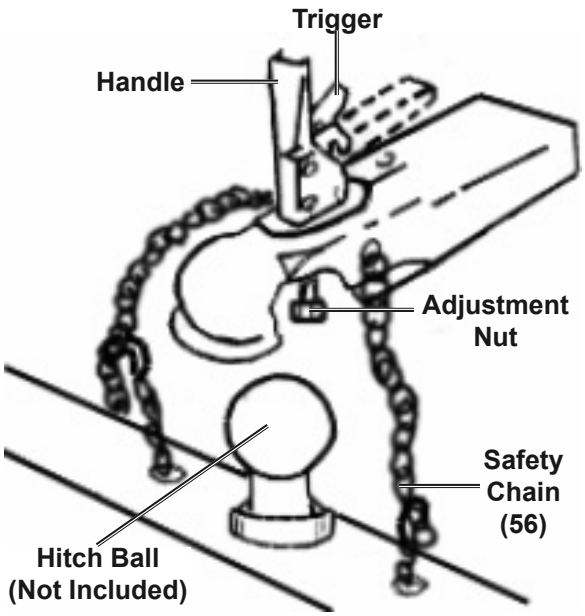


Figure J

8. Pull up and down on the Coupler to make sure the hitch ball is fitting snugly in the Coupler. There should be no play between the hitch ball and Coupler. If there is play, tighten the Adjustment Nut until no play is present. If the Adjustment Nut is too tight, the Handle will not lock.

WARNING! If the Hitch Coupler is not secured properly, the ball could come loose while the Trencher is in motion, possibly causing property damage or SERIOUS PERSONAL INJURY.

9. Make sure to attach each side of the Safety Chain (56) equally to the towing vehicle's rear bumper or frame.

CAUTION! Care must be taken when backing up the Trencher. Only back up the Trencher on a straight path. If the Trencher is allowed to turn off the straight path while backing up, the Trencher could jackknife, causing severe damage to the Trencher and to the towing vehicle.

10. To prevent accidents, turn off the engine, wait for it to cool, and disconnect its spark plug wire after use. Clean external parts with clean cloth, then store the equipment out of children's reach.

⚠WARNING

TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING:
Turn the Power Switch of the equipment to its "OFF" position, wait for the engine to cool, and disconnect the spark plug cap before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM EQUIPMENT FAILURE:
Do not use damaged equipment. If abnormal noise, vibration, or excess smoking occurs, have the problem corrected before further use.

Follow all service instructions in this manual. The engine may fail critically if not serviced properly.

Many maintenance procedures, including any not detailed in this manual, will need to be performed by a qualified technician for safety. If you have any doubts about your ability to safely service the equipment or engine, have a qualified technician service the equipment instead.

Cleaning, Maintenance, and Lubrication Schedule

Note: This maintenance schedule is intended solely as a general guide. If performance decreases or if equipment operates unusually, check systems immediately. The maintenance needs of each piece of equipment will differ depending on factors such as duty cycle, temperature, air quality, fuel quality, and other factors.

Note: The following procedures are in addition to the regular checks and maintenance explained as part of the regular operation of the engine and equipment.

Procedure	Before Each Use	After 20 Operation Hour Break-in Period	Monthly or every 25 hr. of use	Every 3 mo. or 50 hr. of use	Every 6 mo. or 100 hr. of use	Yearly or every 300 hr. of use	Periodically
Brush off outside of engine	✓	✓	✓	✓	✓	✓	✓
Check engine oil level	✓	✓	✓	✓	✓	✓	✓
Check air cleaner	✓			✓	✓	✓	✓
Check deposit cup	✓				✓	✓	✓
Change engine oil		✓	✓	✓	✓	✓	✓
Clean/replace air filter			✓*	✓*	✓*	✓*	✓*
Check and clean spark plug			✓	✓	✓	✓	✓
Blow out water filters			✓	✓	✓	✓	✓
Replace fuel Filter				✓	✓	✓	✓
Replace spark plug					✓	✓	✓
1. Clean fuel tank, strainer and carburetor 2. Clean carbon build-up from combustion chamber						✓**	✓**
Apply grease to boom axis-movement points (see Figure K: Lubrication Points on page 18)							✓
Replace fuel line if necessary							✓**

*Service more frequently when used in dusty areas.

**These items should be serviced by a qualified technician.

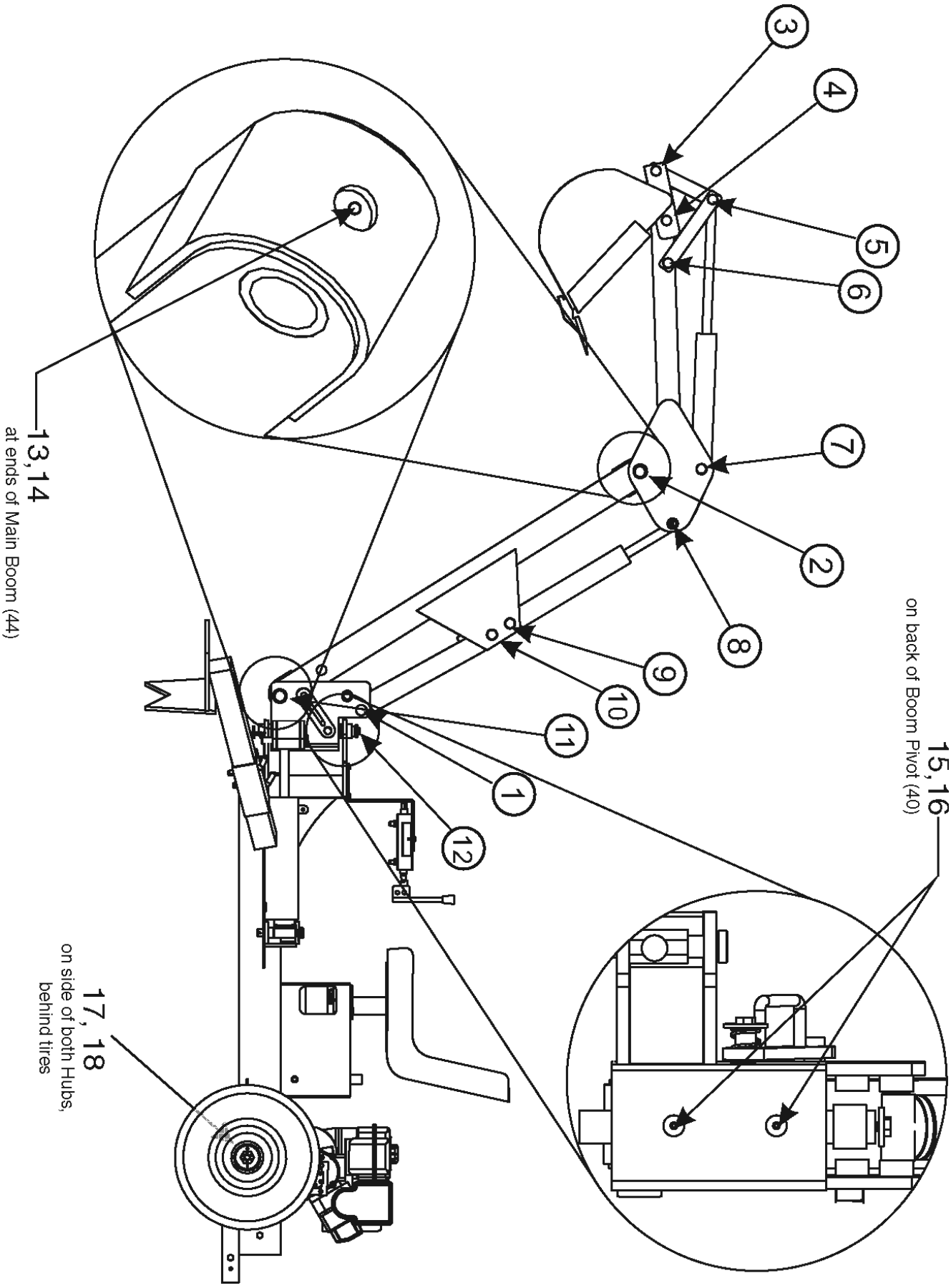


Figure K: Lubrication Points

Fuel Filter Replacement (if equipped)

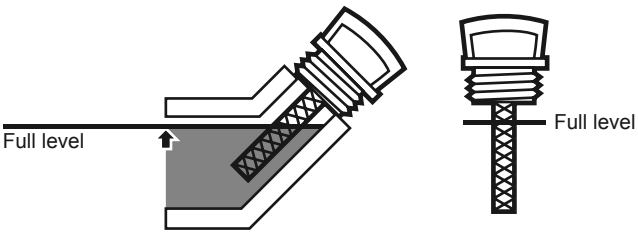
⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE OR EXPLOSION: Fill the fuel tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool. Do not smoke.

1. Wear protective gear including, ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and nitrile gloves.
2. Clean the Fuel Cap and the area around it.
3. Remove Fuel Filter (6R). Reattach Fuel Cap to prevent debris from entering into Gas Tank.
4. Remove Fuel Strainer. Wash with warm water and light detergent. Flush and let dry.
5. Reinstall in the Gas Tank.

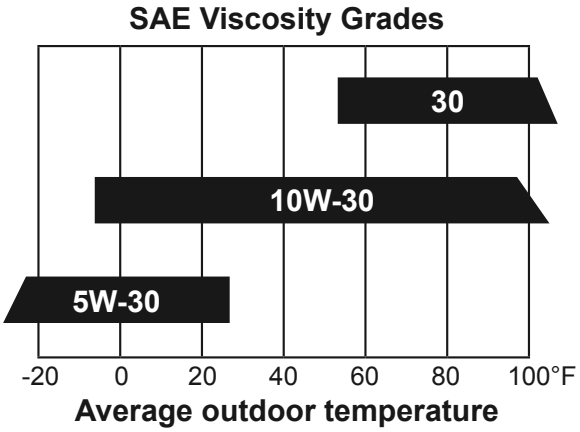
Engine Oil Change

⚠CAUTION! Oil is very hot during operation and can cause burns. Wait for engine to cool before changing oil.

1. Make sure the engine is stopped and is level.
2. Close the Fuel Valve.
3. Place a drain pan (not included) underneath the Crankcase's drain plug.
4. Remove the Drain Plug and, if possible, tilt the Crankcase slightly to help drain the oil out. Recycle used oil.
5. Replace the drain plug and tighten it.
6. Clean the top of the Dipstick and the area around it. Remove the Dipstick by turning it counterclockwise, and wipe it off with a clean, lint free rag.



7. Add the appropriate type of oil until the oil level is at the full level. SAE 10W-30 oil is recommended for general use.
   The SAE Viscosity Grade chart shows other viscosities to use in different average temperatures.



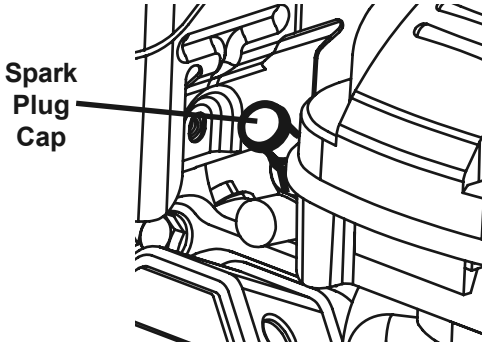
8. Thread the Dipstick back in clockwise.

NOTICE: Do not run the engine with too little oil. The engine will be permanently damaged.

Air Filter Element Maintenance

1. Remove the air filter cover and the air filter elements and check for dirt. Clean as described below.
2. **Cleaning:**
   - For “paper” filter elements:
     To prevent injury from dust and debris, wear ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and heavy-duty work gloves. In a well-ventilated area away from bystanders, use pressurized air to blow dust out of the air filter.
     If this does not get the filter clean, replace it.
   - For foam filter elements:
     Wash the element in warm water and mild detergent several times. Rinse. Squeeze out excess water and allow it to dry completely. Soak the filter in lightweight oil briefly, then squeeze out the excess oil.
3. Install the cleaned filter. Secure the Air Cleaner Cover before use.

Spark Plug Maintenance



1. Disconnect Spark Plug Cap from end of Plug. Clean out debris from around Spark Plug.
2. Using a spark plug wrench, remove the Spark Plug.
3. Inspect the Spark Plug:
   If the electrode is oily, clean it using a clean, dry rag.
   If the electrode has deposits on it, polish it using emery paper. If the white insulator is cracked or chipped, the Spark Plug needs to be replaced.

Recommended Spark Plugs
F7TC (Torch)

NOTICE: Using an incorrect spark plug may damage the engine.

4. When installing a new spark plug, adjust the plug’s gap to the specification on the Specifications chart. Do not pry against the electrode; the spark plug can be damaged.
5. Install the new spark plug or the cleaned spark plug into the engine.
   - **Gasket-style**:
     Finger-tighten until the Gasket contacts the Cylinder Head, then tighten about 1/2-2/3 turn more.
   - **Non-gasket-style**:
     Finger-tighten until the plug contacts the Cylinder Head, then tighten about 1/16 turn more.

NOTICE: Tighten the Spark Plug properly.
If loose, the Spark Plug will cause the engine to overheat.
If overtightened, the threads in the engine block will be damaged.

6. Apply dielectric spark plug boot protector (not included) to the end of the Spark Plug and reattach the wire securely.

Long-Term Storage

When the equipment is to remain idle for longer than 20 days, prepare the engine for storage as follows:

1. **CLEANING**:
   Wait for engine to cool, then clean engine with dry cloth. **NOTICE: Do not clean using water.** The water will gradually enter the engine and cause rust damage. Apply a thin coat of rust preventive oil to all metal parts.
2. **FUEL:**

⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
To protect the fuel tank during storage, fill the tank with gasoline treated with fuel stabilizer in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke. Refer to Checking and Filling Fuel on page 10.

3. **LUBRICATION:**
   a. Change engine oil.
   b. Clean out area around spark plug. Remove spark plug and pour one tablespoon of engine oil into cylinder through spark plug hole.
   c. Replace spark plug, but leave spark plug cap disconnected.
   d. Pull Starter Handle to distribute oil in cylinder. Stop after one or two revolutions when you feel the piston start the compression stroke (when you start to feel resistance).
4. **BATTERY:**
   Disconnect battery cables (if equipped). Recharge batteries monthly while in storage.
5. **STORAGE AREA:**
   Cover and store in a dry, level, well-ventilated area out of reach of children. Storage area should also be away from ignition sources, such as water heaters, clothes dryers, and furnaces.

NOTICE: During extended storage periods the Engine must be started every 3 months and allowed to run for 15–20 minutes or the Warranty is VOID.

6. **STARTING ENGINE DURING/AFTER STORAGE:**
   Before starting the Engine during or after storage, keep in mind that untreated gasoline will deteriorate quickly. Drain the fuel tank and change to fresh fuel if untreated gasoline has been sitting for a month, if treated gasoline has been sitting beyond the fuel stabilizer's recommended time period, or if the Engine does not start. For Engine starting instructions refer to Starting the Engine on page 10.

Troubleshooting

Problem	Possible Causes	Probable Solutions
Engine will not start	FUEL RELATED: 1. No fuel in tank or fuel valve closed. 2. Choke not in start position, especially with cold engine. 3. Low quality or deteriorated old gasoline. 4. Carburetor not primed. 5. Dirty fuel passageways blocking fuel flow. 6. Carburetor needle stuck. Fuel can be smelled in the air. 7. Too much fuel in chamber. This can be caused by the carburetor needle sticking.	FUEL RELATED: 1. Fill fuel tank and open fuel valve. 2. Move choke to start position if engine is cold. 3. Use only fresh 87+ octane unleaded gasoline. 4. Prime Carburetor by pressing priming bulb (if equipped). 5. Clean out passageways using fuel additive. Heavy deposits may require further cleaning. 6. Gently tap side of Carburetor float chamber with screwdriver handle. 7. Turn Fuel Valve to its off position. Turn choke to run position. Remove spark plug and pull the start handle several times to air out the chamber. Reinstall spark plug and set choke to start position.
	IGNITION (SPARK) RELATED: 1. Spark Plug Cap not connected securely. 2. Spark Plug electrode wet or dirty. 3. Incorrect Spark Plug Gap. 4. Spark Plug Cap broken. 5. Incorrect spark timing or faulty ignition system.	IGNITION (SPARK) RELATED: 1. Connect Spark Plug Cap properly. 2. Clean Spark Plug. 3. Correct Spark Plug Gap. 4. Replace Spark Plug Cap. 5. Have qualified technician diagnose/ repair ignition system.
	COMPRESSION RELATED: 1. Cylinder not lubricated. Problem after long storage periods. 2. Loose or broken Spark Plug. (Hissing noise will occur when trying to start.) 3. Loose Cylinder Head or damaged Head Gasket. (Hissing noise will occur when trying to start.) 4. Engine valves or tappets mis-adjusted or stuck.	COMPRESSION RELATED: 1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again. 2. Tighten Spark Plug. If that does not work, replace spark plug. If problem persists, may have head gasket problem, see #3. 3. Tighten head. If that does not remedy problem, replace head gasket. 4. Have qualified technician adjust/ repair valves and tappets.
Trencher loses performance	1. Mushy hydraulic operation. 2. Oil Leaks.	1. Bleed hydraulic system. Replace hydraulic filter/clean strainer. 2. Tighten/replace hose.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Problem	Possible Causes	Probable Solutions
Engine misfires	1. Spark Plug Cap loose. 2. Incorrect Spark Plug Gap or damaged Spark Plug. 3. Defective Spark Plug Cap. 4. Old or low quality gasoline. 5. Incorrect compression.	1. Check wire connections. 2. Re-gap or replace Spark Plug. 3. Replace Spark Plug Cap. 4. Use only fresh 87+ octane unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 5. Diagnose and repair compression. (Use **Engine will not start: COMPRESSION RELATED** section.)
Engine stops suddenly	1. Fuel Tank empty or full of impure or low quality gasoline. 2. Low oil shutdown. 3. Defective fuel tank cap creating vacuum, preventing proper fuel flow. 4. Faulty magneto. 5. Disconnected or improperly connected spark plug cap.	1. Fill Fuel Tank with fresh 87+ octane unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Fill engine oil to proper level. Check engine oil before EVERY use. 3. Test/replace fuel tank cap. 4. Have qualified technician service magneto. 5. Secure spark plug cap.
Engine stops when under heavy load	1. Dirty Air Filter 2. Engine running cold.	1. Clean or replace element. 2. Allow engine to warm up prior to operating equipment.
Engine knocks	1. Old or low quality gasoline. 2. Engine overloaded. 3. Incorrect spark timing, deposit buildup, worn engine, or other mechanical problems.	1. Fill Fuel Tank with fresh 87+ octane unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Do not exceed equipment's load rating. 3. Have qualified technician diagnose and service engine.
Engine backfires	1. Impure or low quality gasoline. 2. Engine too cold. 3. Intake Valve stuck or overheated engine. 4. Incorrect timing.	1. Fill Fuel Tank with fresh 87+ octane unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Use cold weather fuel and oil additives to prevent backfiring. 3. Have qualified technician diagnose and service engine. 4. Check engine timing.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Limited 90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Emissions Control System Warranty

California and United States Emissions Control Defects Warranty Statement

The California Air Resources Board (herein CARB), the United States Environmental Protection Agency (herein EPA), and Harbor Freight Tools (herein HFT) are pleased to explain the emissions control system warranty on your 2014-2015 Small Off-Road Engine (herein engine). In California, the engine must be designed, built and equipped to meet the State's stringent anti-smog standards. Elsewhere within the United States, new off-road, spark-ignition engines certified for model year 2014-2015, must meet similar standards set forth by the EPA. HFT must warrant the emissions control system on your engine for the periods of time described below, provided there has been no abuse, neglect or improper maintenance of your engine.

Your emissions control system may include parts such as the carburetor or fuel-injection system, and the ignition system. Also included may be hoses, belts, connectors and other emissions-related assemblies.

Where a warrantable condition exists, HFT will repair your engine at no cost to you including diagnosis, parts and labor.

Manufacturer's Warranty Coverage

The 2014-2015 engines are warranted for two (2) years. If any emissions-related part on your engine is defective, the part will be repaired or replaced by HFT.

Harbor Freight Tools Emissions Control Defects Warranty Coverage

Engines are warranted for a period of two (2) years relative to emissions control parts defects, subject to the provisions set forth below. If any emissions related part on your engine is defective, the part will be repaired or replaced by HFT.

Owner's Warranty Responsibilities

- As the engine owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. HFT recommends that you retain all receipts covering maintenance on your engine, but HFT cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the engine owner, you should, however, be aware that HFT may deny you warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.
- You are responsible for shipping your engine to a HFT warranty station as soon as a problem exists. Contact the HFT Customer Service department at the number below to make shipping arrangements. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact the Harbor Freight Tools Customer Service Department at 1-888-866-5797.

Harbor Freight Tools Emissions Control Defects Warranty Provisions

1. Length of Coverage

HFT warrants to a first retail purchaser and each subsequent purchaser that the engine is free from defects in materials and workmanship that cause the failure of warranted parts for a period of two (2) years after the date of delivery to the first retail purchaser.

2. No Charge Repair or Replacement

Repair or replacement of any warranted part will be performed at no charge to the owner if the work is performed through a warranty station authorized by HFT. For emissions warranty service, contact the HFT Customer Service Department at 1-888-866-5797.

3. Consequential Damages Coverage

Coverage under this warranty shall also extend to the failure of any engine components caused by the failure of any warranted part while it is still covered under this warranty.

4. Coverage Exclusions

Warranty claims shall be filed in accordance with the provisions of the HFT warranty policy explained in the box at the top of the previous page. HFT shall not be liable for any loss of use of the engine, for any alternative usage, for any damage to goods, loss of time, or inconvenience. Warranty coverage shall also be excluded for any part which fails, malfunctions, or is damaged due to failure to follow the maintenance and operating instructions set forth in the Owner's Manual including, but not limited to:

a) Use of parts which are not authorized by HFT

b) Improper installation, adjustment or repair of the engine or of any warranted part unless performed by an authorized warranty center

c) Failure to follow recommendations on fuel use contained in the Owner's Manual

d) Improper or inadequate maintenance of any warranted parts

e) Repairs performed outside of the authorized warranty service dealers

f) Alterations by changing, adding to or removing parts from the engine.

5. Service and Maintenance

Component parts which are not scheduled for replacement as required maintenance or are scheduled only for regular inspection to the effect of "repair or replace as necessary" are warranted for the warranty period. Any warranted part which is scheduled for replacement as required maintenance is warranted for the period of time up to the first scheduled replacement point for that part. Any replacement part, provided it is equivalent in durability and performance, may be used in performance of maintenance or repairs. The owner is responsible for commissioning a qualified technician/mechanic to perform all required maintenance, as outlined in the Inspection, Cleaning, and Maintenance section in this manual.

6. Warranted Parts

1) Fuel Metering System

i) Carburetor and its internal parts.

ii) Fuel pump (if so equipped).

iii) Cold start enrichment system.

2) Air Induction System

i) Intake pipe/manifold.

ii) Air cleaner.

3) Ignition System

i) Spark plug.

ii) Magneto ignition system.

4) Catalyst System (if so equipped)

i) Exhaust pipe stud.

ii) Muffler.

iii) Catalytic converter (if so equipped).

5) Miscellaneous Items Used in Above Systems

i) Vacuum, temperature and time sensitive valves and switches.

ii) Hoses, belts, connectors, and assemblies.

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Main Parts List

Part	Description	Qty.
1	Nut 3/8"	4
2	Spring Washer 3/8"	10
3	Control Support	1
4	Washer 3/8"	9
5	Hex Hd. Bolt 3/8"*1-1/8"	8
6	Scutcheon	1
7	Hose Assembly No.6	1
8	Hex Connector	10
9	Control Valve	1
10	Seat Bottom	1
11	Fill Plug/Dipstick	1
12	Spring Washer 5/16"	17
13	Enter Hose Assembly No.1	1
14	Hex Bolt 3/8"*1"	2
15	Safety Locking Pin	2
16	Spring Hair Pin Clip	8
17	Hose Assembly No.4	1
18	Hose Assembly No.9	1
19	Extension Leg (Right)	1
20	Lock Pin No.1	4
21	Hose Assembly No.5	1
22	Hose Assembly No.10	1
23	Control Panel	1
24	Leg Assembly	2
25	90 Elbow Fitting No.1	8
26	Cylinder	4
27	Connecting Rod	2
28	Connecting Rod	2
29	Clevis Pin No.1	8
30	Bushing	1
31	Hair Pin Clip 3/16"*2-5/16"	15
32	Bucket Assembly	1
33	Lubrication Fitting	11
34	Boom Extension	1
35	Clevis Pin No.2	2
36	Main Boom	1
37	Lubrication Fitting	6
38	Boom Pivot	1
39	Hose Assembly No.3	1
40	Hose Assembly No.8	1
41	Safety Latch	1
42	Pin	2
43	Spring	1
44	Washer 15/16"	1
45	Extension Leg (Left)	1
46A	Hose Assembly No.2	2
47	Hex Nut 5/16"	5
48	Hex Hd. Bolt 5/16"*3/4”	3
49	Cover	1
50	Axle & Hub Assembly	2

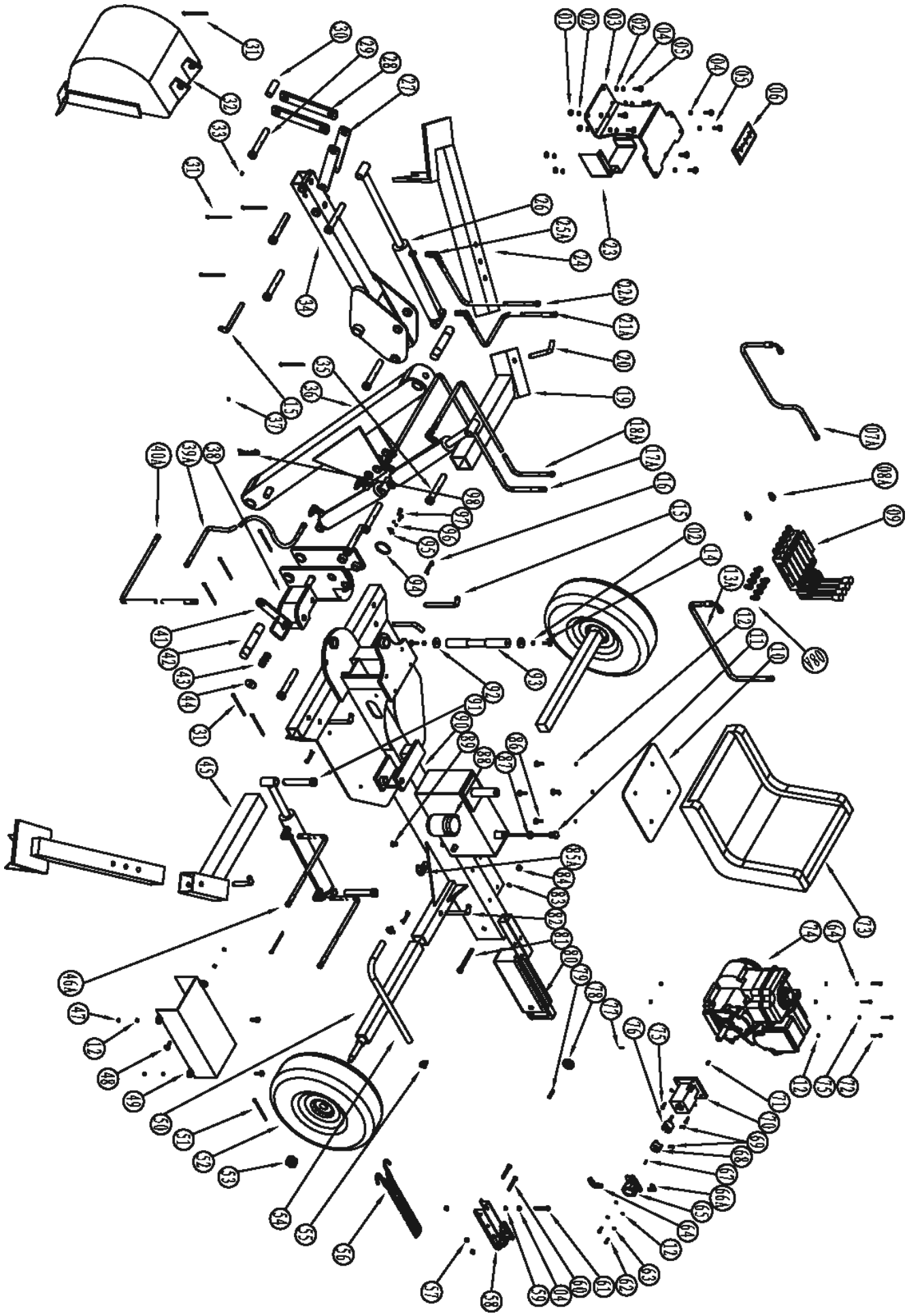
Part	Description	Qty.
51	Hair Pin Clip 1/8"*1-3/4"	2
52	Tire	2
53	Lug Nut	2
54	Outlet Hose	1
55	Hose Clamp	2
56	Safety Chain	1
57	Hexnut 3/8"	3
58	Hitch Coupler	1
59	Nut ½	1
60	Hex Hd. Bolt 3/8"*2-3/4"	2
61	Hex Hd. Bolt 3/8"*3-1/2"	1
62	Hex Hd. Bolt 5/16"*1"	2
63	Washer	6
64	90 Elbow Fitting No.4	1
65	Hydraulic Pump	1
66	90 Deg. Elbow Fitting No.3	1
67	Pump Key	1
68	Couping-Pump Side	1
69	Hex Screw	2
70	Mounting Bracket - Pump	1
71	Engine Key	1
72	Hex Hd. Bolt 5/16"*1-3/4"	4
73	Seat	1
74	Engine	1
75	Hex Hd. Bolt 5/16"	4
76	Couping-Engine Side	1
77	Hair Pin Clip	1
78	Wheel	1
79	Lock Pin	1
80	Weight Block	1
81	Hex Hd. Bolt 5/8"*4-3/4"	1
82	Lock Pin No.2	2
83	Washer 5/8	1
84	Nut 5/8"	1
85	90 Elbow Fitting No.2	1
86	Hex Hd.bolt 5/16"*1-1/8"	4
87	“O” Ring Seal	1
88	Oil Filter	1
89	Oil Plug R3/8"	1
90	Frame Assembly	1
91	Clevis Pin No.3	1
92	Washer	2
93	Pivot Pin	1
94	Bushing	1
95	Snap Spring	1
96	Spring Washer 1/4"	2
97	Hex Hd. Bolt 1/4"*1/2"	2
98	Spring Hair Pin Clip	1
99	Spider	1

Record Product’s Serial Number Here:_____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

Main Assembly Diagram

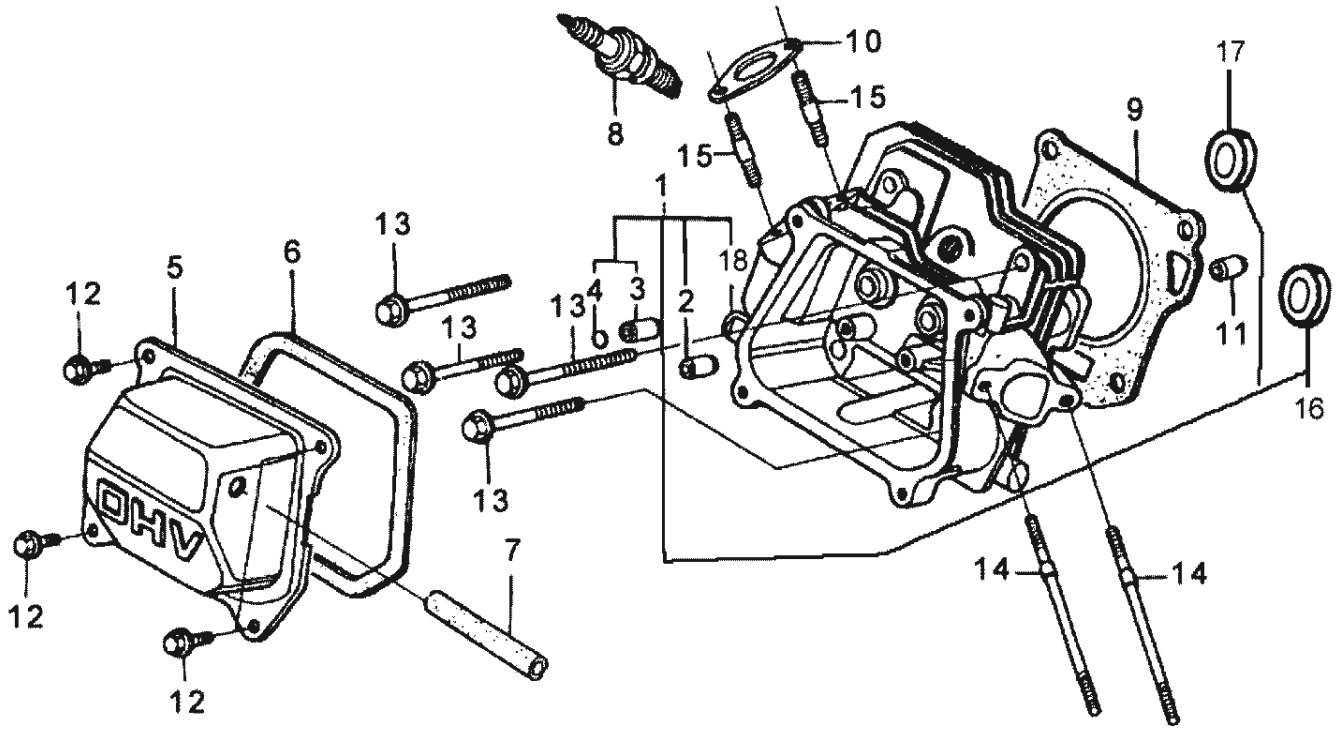


Parts List B - Cylinder Head

Part	Description	Qty.
1B	Cylinder Head Assembly	1
2B	Intake Valve Guide	1
3B	Exhaust Valve Guide	1
4B	Valve Guide Clip	1
5B	Cover	1
6B	Packing	1
7B	Breathing Tube	1
8B	Spark Plug	1
9B	Cylinder Gasket	1

Part	Description	Qty.
10B	Muffler Gasket	1
11B	Pin	2
12B	Bolt 6x14	4
13B	Bolt 8x55	4
14B	Intake Bolt	2
15B	Exhaust Bolt	2
16B	Intake Valve Seat	1
17B	Exhaust Valve Seat	1
18B	Cylinder Head	1

Diagram B - Cylinder Head



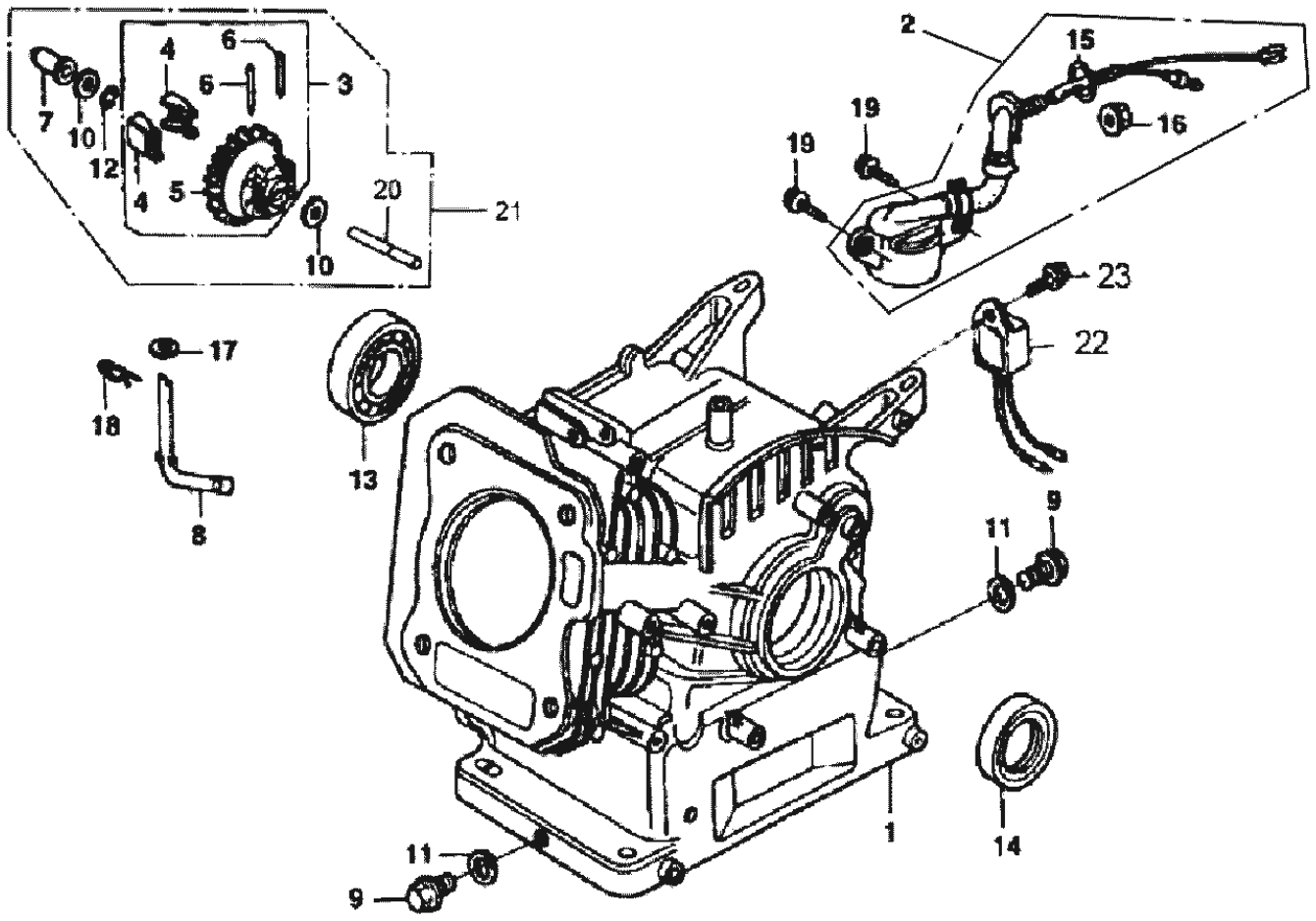
Note: When ordering replacement parts from this diagram, use the suffix “B”.

Parts List C - Crank Case

Part	Description	Qty.
1C	Crank Case Assembly	1
2C	Oil Level Switch	1
3C	Governor Gear Assembly	1
4C	Weight	2
5C	Governor Gear	1
6C	Weight Pin	2
7C	Slider	1
8C	Shaft Arm	1
9C	Drain Plug	2
10C	Washer	2
11C	Washer	2
12C	Clip	1

Part	Description	Qty.
13C	Ball Bearing	1
14C	Oil Seal	1
15C	O-Ring	1
16C	Nut	1
17C	Washer	1
18C	R-Pin	1
19C	Bolt 6x12	3
20C	Shaft	1
21C	Governor Assembly	1
22C	Oil Alarm	1
23C	Bolt	1

Diagram C - Crank Case



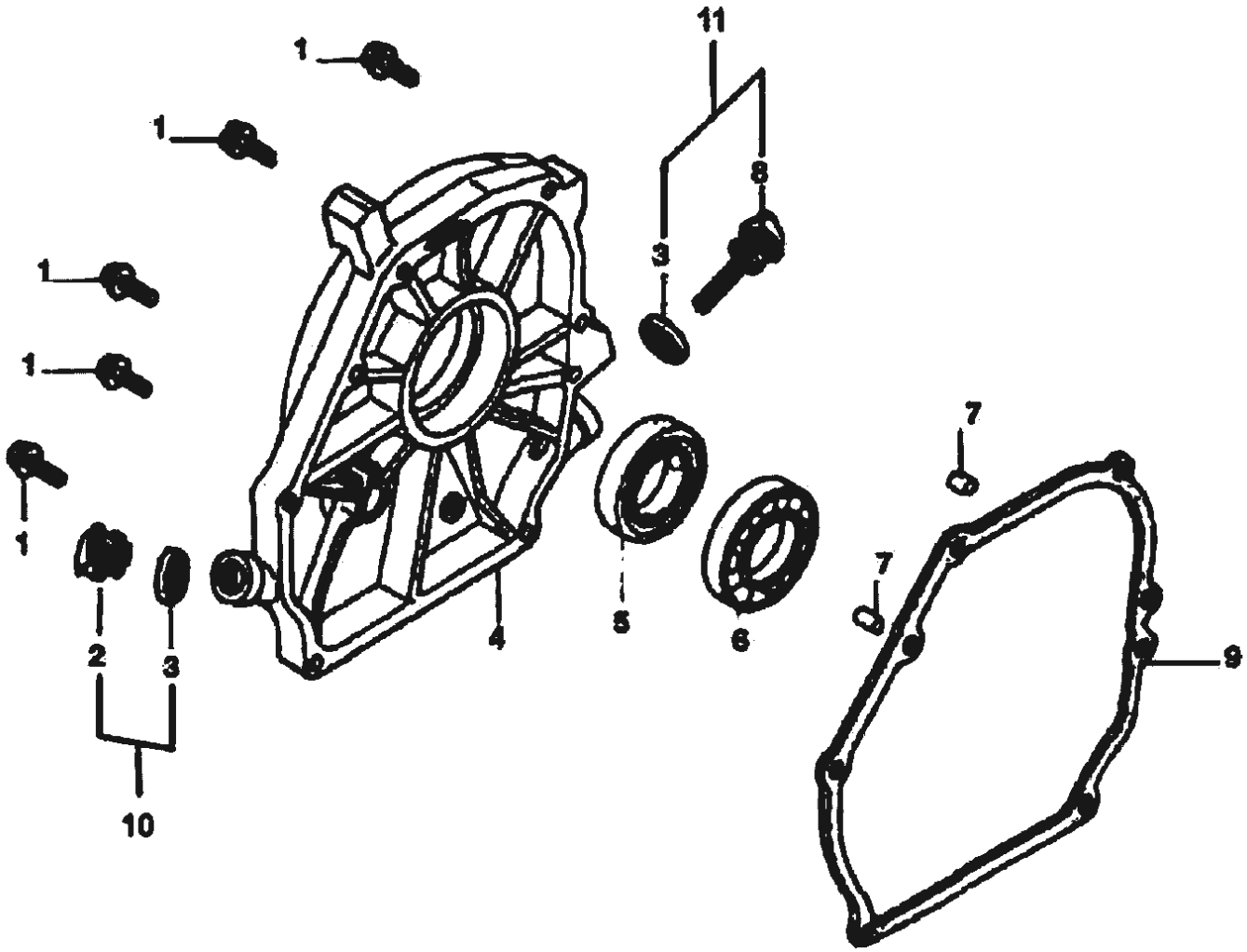
Note: When ordering replacement parts from this diagram, use the suffix “C”.

Parts List D - Crank Case Cover

Part	Description	Qty.
1D	Bolt	6
2D	Oil Stick	1
3D	Gasket	2
4D	Cover	1
5D	Oil Seal	1
6D	Bearing	1

Part	Description	Qty.
7D	Pin	2
8D	Oil Filler Cap	1
9D	Gasket Case Cover	1
10D	Oil Fill Assembly	1
11D	Cap Assembly	1

Diagram D - Crank Case Cover



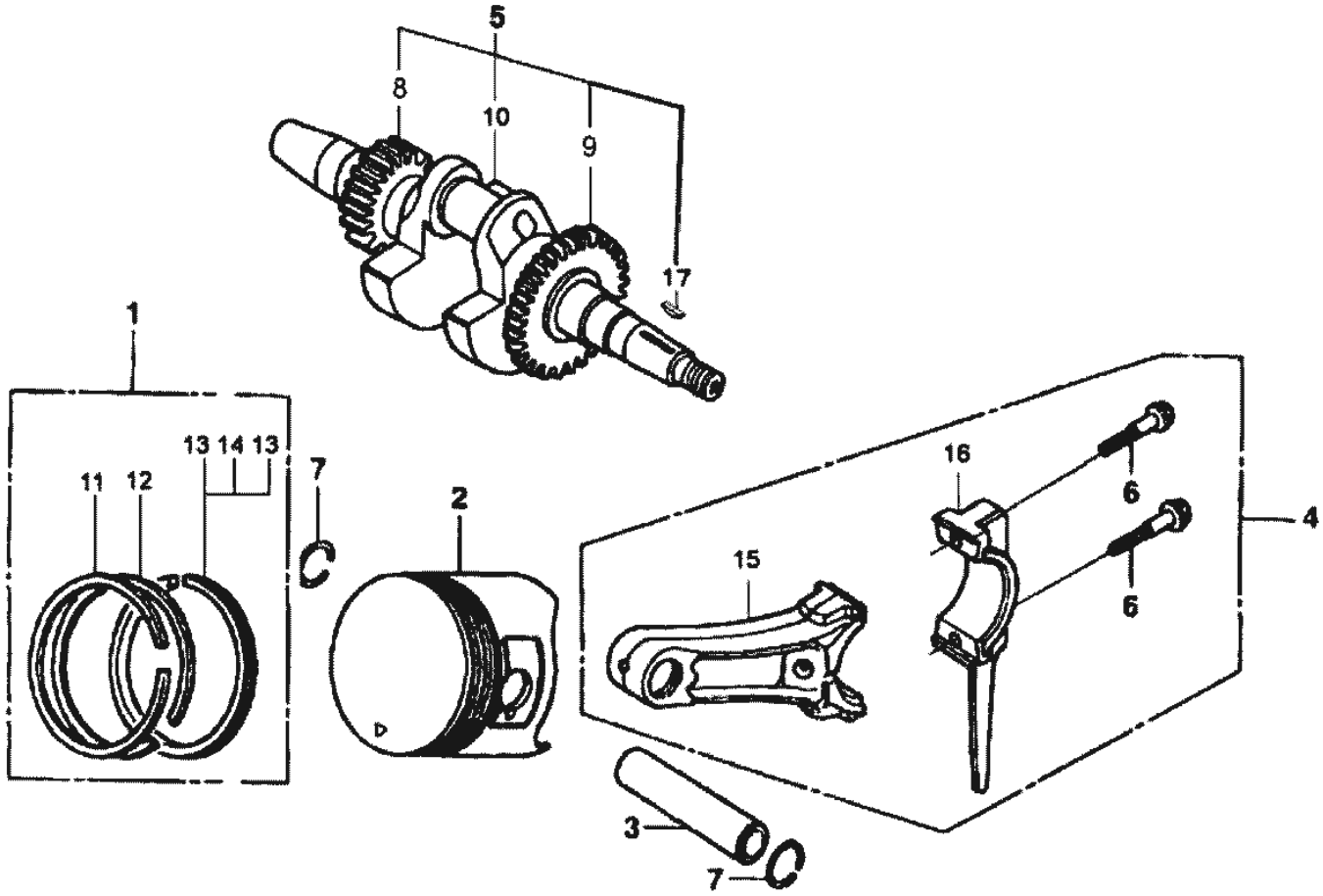
Note: When ordering replacement parts from this diagram, use the suffix “D”.

Parts List E - Crankshaft/Piston

Part	Description	Qty.
1E	Ring Set	1
2E	Piston	1
3E	Pin	1
4E	Rod Assembly	1
5E	Crankshaft Assembly	1
6E	Bolt	2
7E	Clip	2
8E	Timing Gear	1
9E	Gear	1

Part	Description	Qty.
10E	Crankshaft	1
11E	First Ring	1
12E	Second Ring	1
13E	Oil Ring	2
14E	Bushing Ring	1
15E	Connecting Rod	1
16E	Connecting Rod Bearing Cap	1
17E	Key	1

Diagram E - Crankshaft/Piston



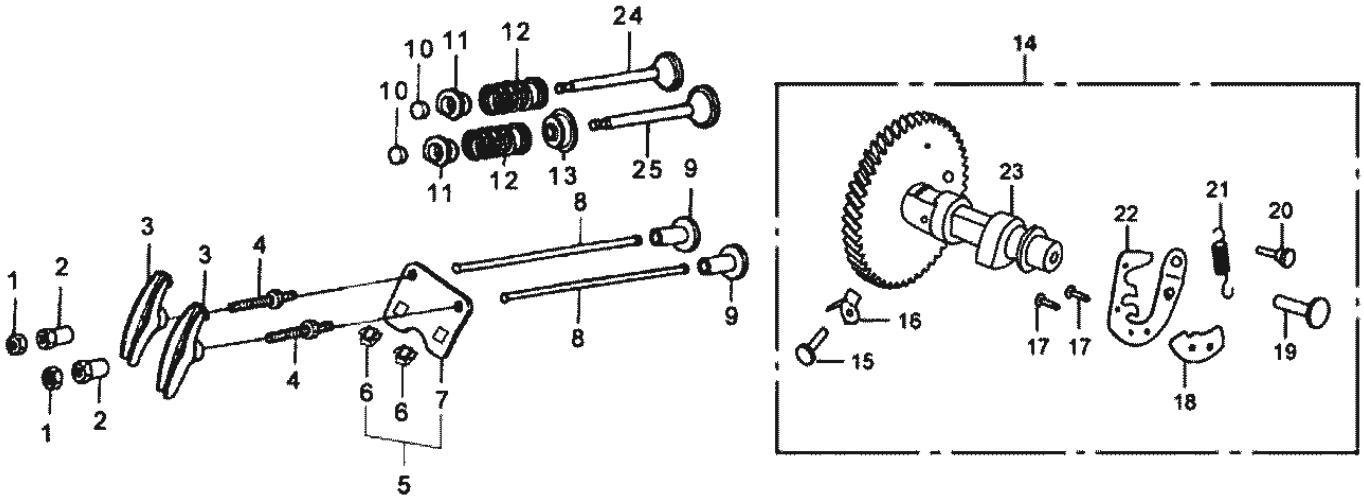
Note: When ordering replacement parts from this diagram, use the suffix “E”.

Parts List F - Gas Distribution Adjustment System

Part	Description	Qty.
1F	Nut	2
2F	Rocker Arm	2
3F	Valve Rocker	2
4F	Pivot Bolt	2
5F	Plate Assembly	1
6F	Block Guide	2
7F	Push Rod Guide	1
8F	Push Rod	2
9F	Valve Lifter	2
10F	Valve Cap	2
11F	Valve Spring Retainer	2
12F	Valve Spring	2
13F	Guide Seal	1

Part	Description	Qty.
14F	Camshaft Assembly	1
15F	Reducer Pin	1
16F	Reducer	1
17F	Matching Block Pin	2
18F	Matching Block	1
19F	Flying Block Pin	1
20F	Spring Pin	1
21F	Flying Block Spring	1
22F	Flying Block	1
23F	Camshaft	1
24F	Exhaust Valve	1
25F	Intake Valve	1

Diagram F - Gas Distribution Adjustment System



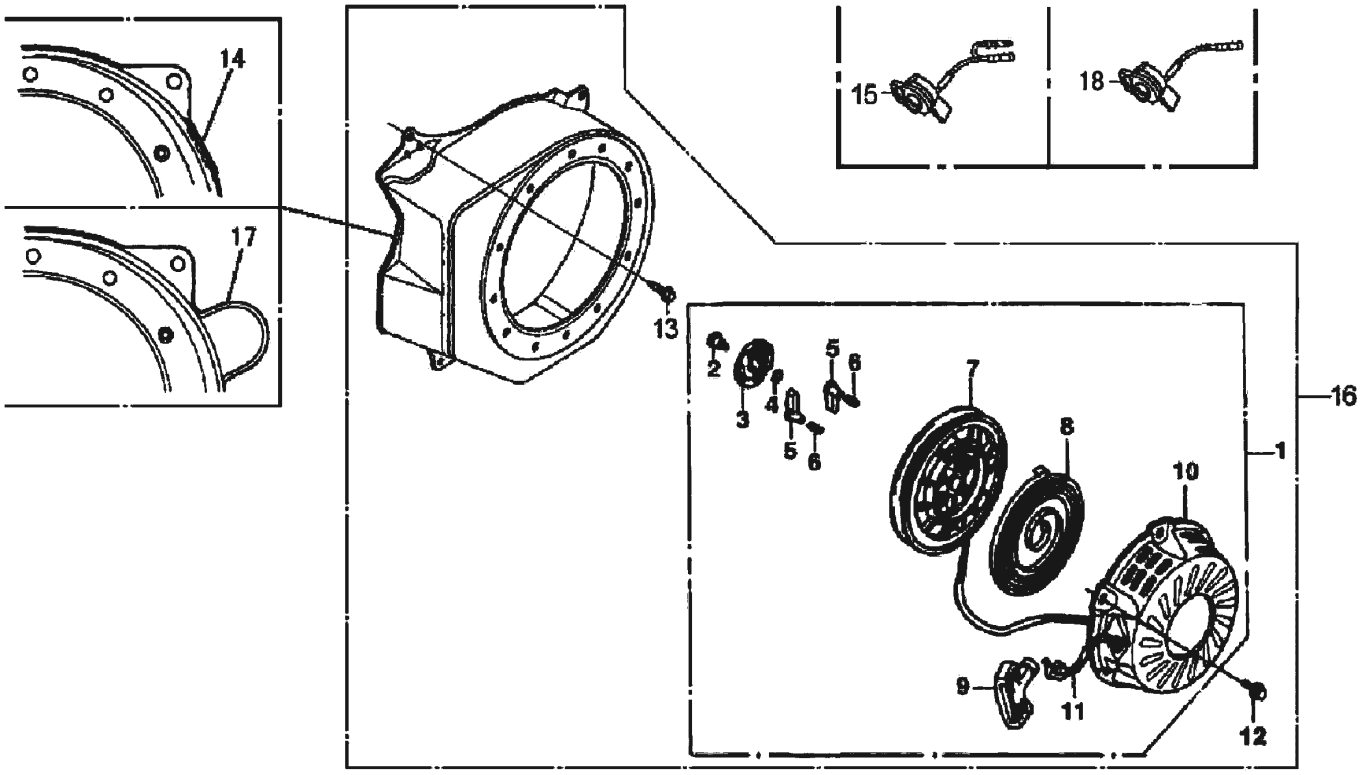
Note: When ordering replacement parts from this diagram, use the suffix “F”.

Parts List G - Starter Subassembly

Part	Description	Qty.
1G	Starter Assembly	1
2G	Set Screw	1
3G	Ratchet Guide	1
4G	Friction Spring	1
5G	Starter Ratchet	2
6G	Return Spring	2
7G	Recoil Starter Reel	1
8G	Recoil Starter Spring	1
9G	Recoil Starter Knob	1

Part	Description	Qty.
10G	Fan Cover	1
11G	Rope	1
12G	Bolt 6x8	3
13G	Bolt 6x10	4
14G	Fan Cover	1
15G	Switch Assembly	1
16G	Recoil Starter	1
17G	Fan Cover	1
18G	Stop Switch Assembly	1

Diagram G - Starter Subassembly



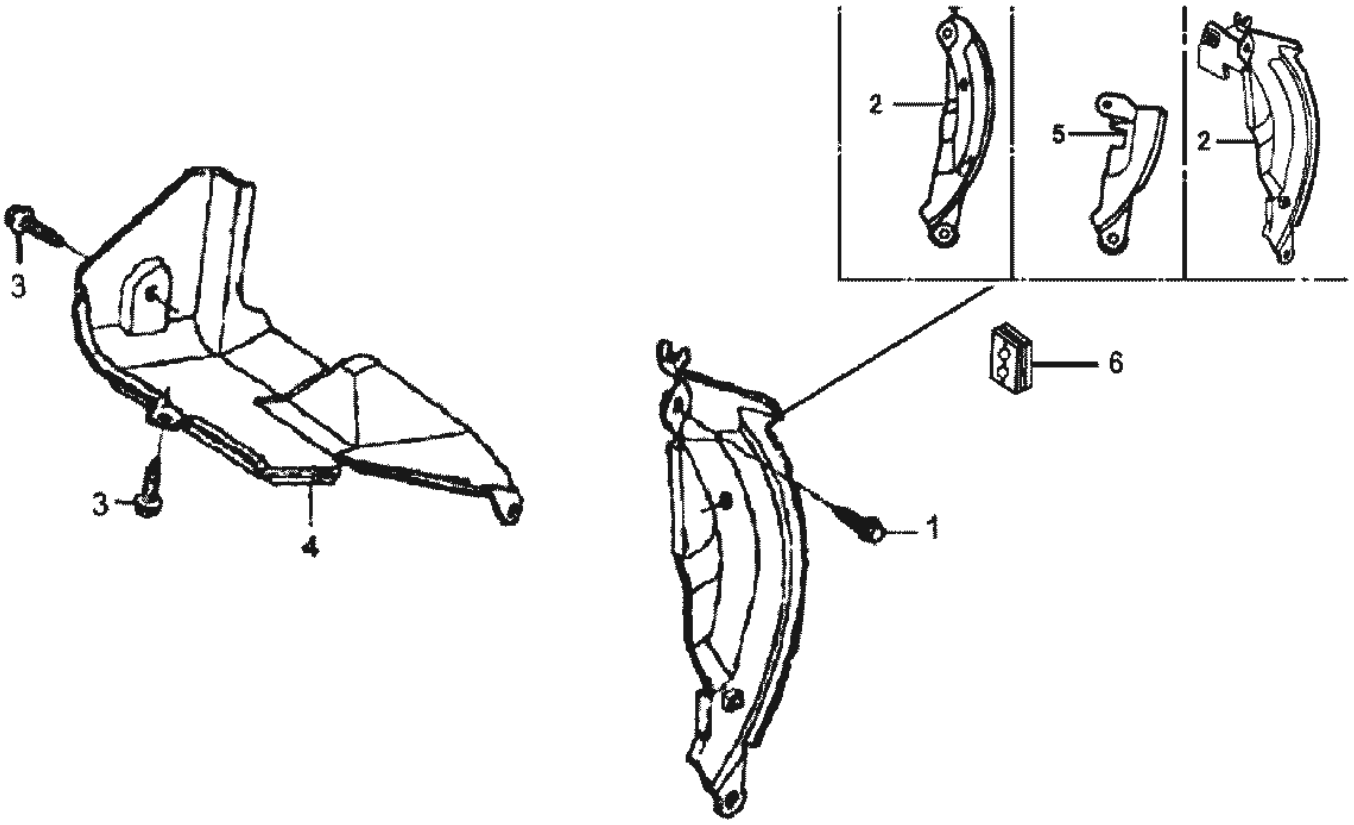
Note: When ordering replacement parts from this diagram, use the suffix “G”.

Parts List H - Diversion Assembly

Part	Description	Qty.
1H	Bolt 6x20	1
2H	Side Plate	1
3H	Bolt 6x8	2

Part	Description	Qty.
4H	Shroud	1
5H	Side Plate	1
6H	Grommet	1

Diagram H - Diversion Assembly



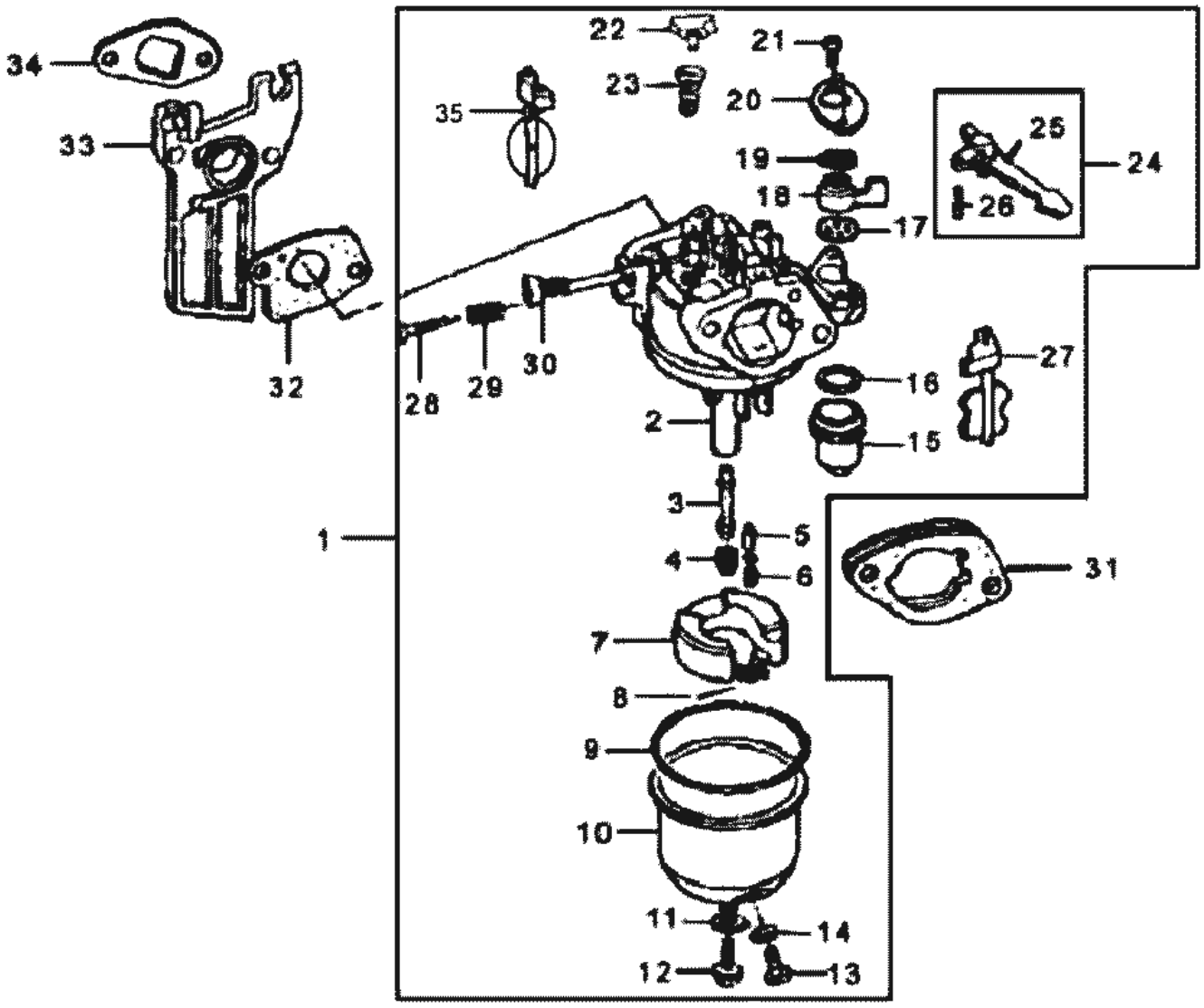
Note: When ordering replacement parts from this diagram, use the suffix “H”.

Parts List J - Carburetor

Part	Description	Qty.
1J	Carburetor Assembly	1
2J	Carburetor	1
3J	Main Nozzle	1
4J	Main Jet	1
5J	Float Valve	1
6J	Valve Set Spring	1
7J	Float	1
8J	Float Pin	1
9J	Oil Cup Gasket	1
10J	Oil Cup	1
11J	Gasket Bolt	1
12J	Bolt	1
13J	Drain Bolt	1
14J	Drain Bolt Gasket	1
15J	Fuel Strainer Cup	1
16J	Fuel Strainer Cup Packing	1
17J	Fuel Packing	1
18J	Lever	1

Part	Description	Qty.
19J	Lever Spring	1
20J	Setting Plate	1
21J	Screw 3x8	2
22J	Jet Set	1
23J	Pilot Jet Set	1
24J	Choke Lever Assembly	1
25J	Choke Lever	1
26J	Choke Lever Pin	1
27J	Choke Set	1
28J	Screw	1
29J	Screw Spring	1
30J	Throttle Stop Screw	1
31J	Packing	1
32J	Carburetor Packing	1
33J	Carburetor Insulation	1
34J	Packing	1
35J	Throttle Valve	1

Diagram J - Carburetor



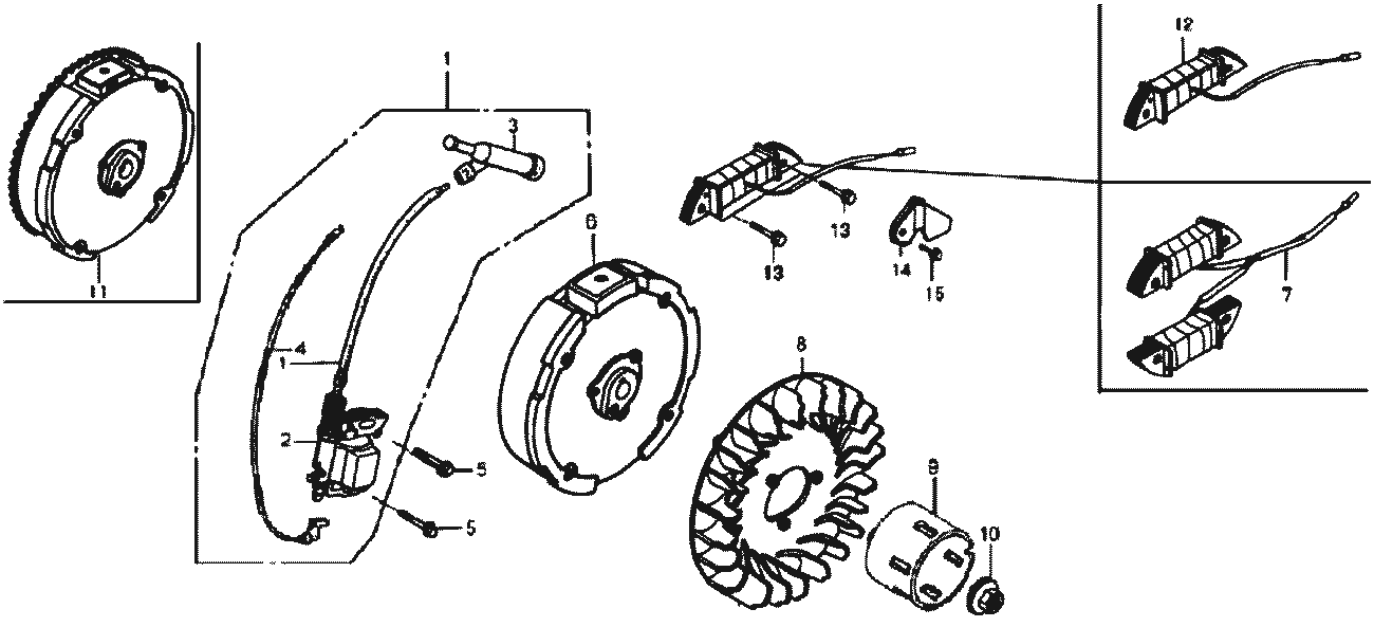
Note: When ordering replacement parts from this diagram, use the suffix “J”.

Parts List K - Flywheel/Coil Assembly

Part	Description	Qty.
1K	Ignition Assembly	1
2K	Ignition Coil	2
3K	Noise Suppression Cap Assembly	1
4K	Stop Switch Cord	1
5K	Bolt 6x30	2
6K	Flywheel Cover	1
7K	Charge Coil Assembly	1
8K	Cooling Fan	1

Part	Description	Qty.
9K	Starter Pulley	1
10K	Nut	1
11K	Flywheel	1
12K	Charge Coil	1
13K	Bolt 6x35	2
14K	Cord Clamp	1
15K	Bolt 6x8	1

Diagram K - Flywheel/Coil Assembly



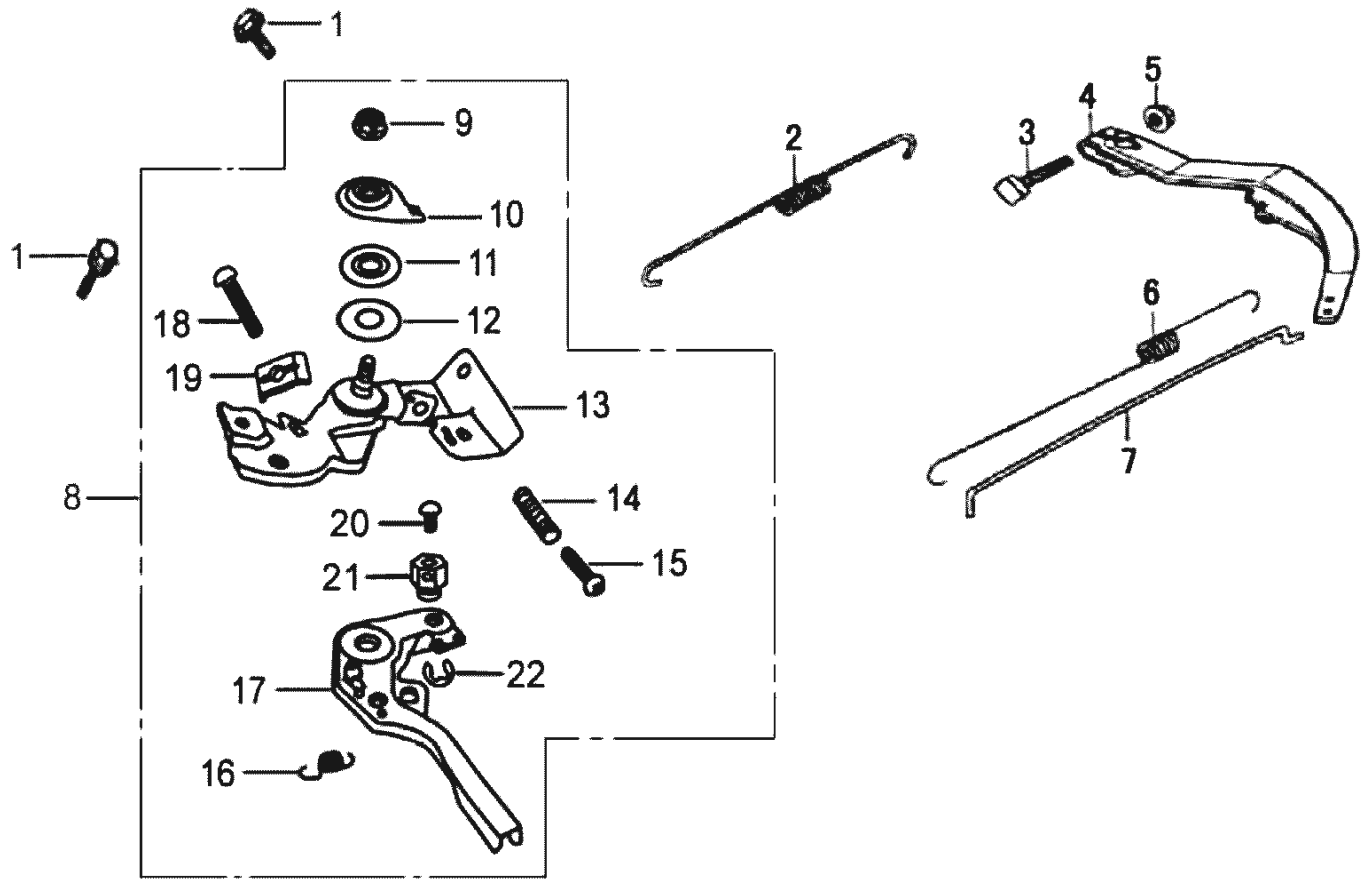
Note: When ordering replacement parts from this diagram, use the suffix “K”.

Parts List M - Control System

Part	Description	Qty.
1M	Bolt	2
2M	Governor Spring	1
3M	Bolt	1
4M	Governor Arm	1
5M	Nut	1
6M	Throttle Return Spring	1
7M	Linkage	1
8M	Control Assembly	1
9M	Nut	1
10M	Fixing Plate	1
11M	Washer	1

Part	Description	Qty.
12M	Washer	1
13M	Retainer Assembly	1
14M	Spring	1
15M	Screw 5x35	
16M	Cable Return Spring	1
17M	Control Handle	1
18M	Screw 5x25	1
19M	Back Plate	1
20M	Screw 4x6	1
21M	Locking Ring	1
22M	Clip	1

Diagram M - Control System



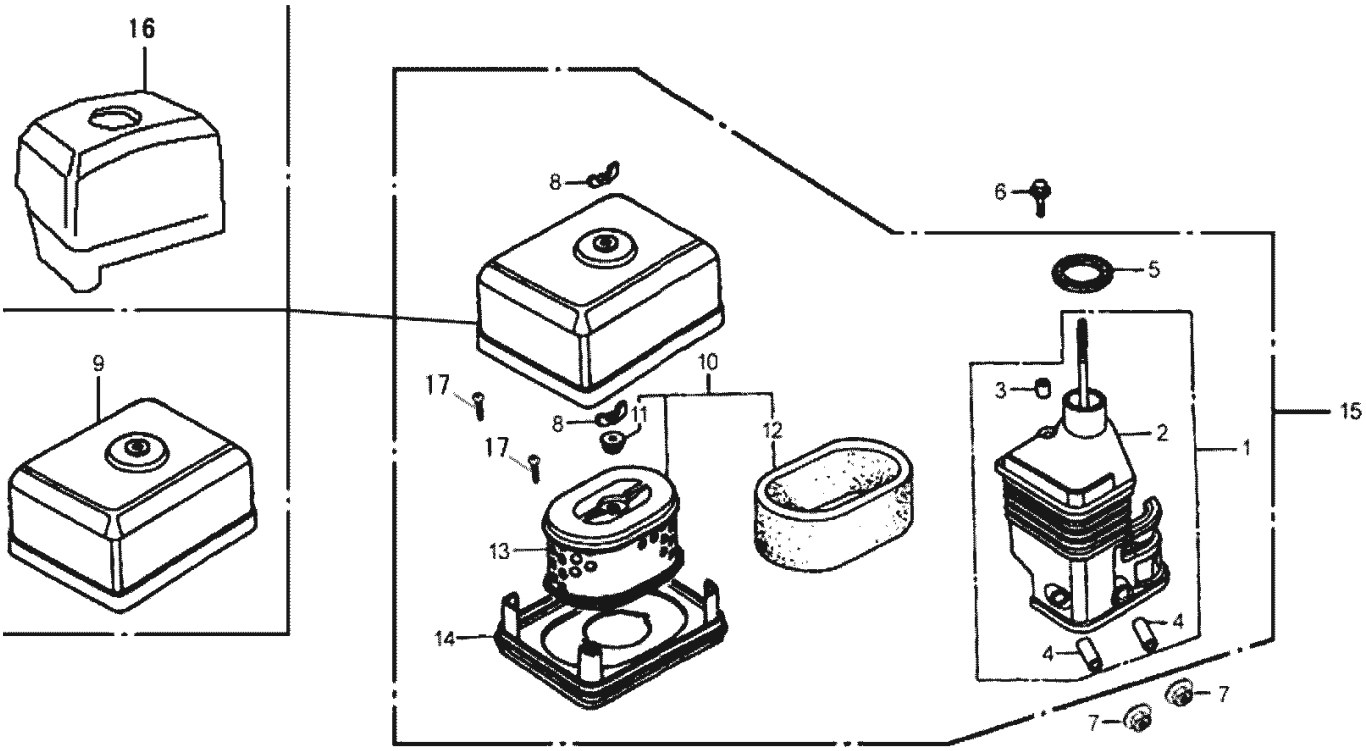
Note: When ordering replacement parts from this diagram, use the suffix “M”.

Parts List N - Air Cleaner

Part	Description	Qty.
1N	Air Cleaner Assembly	1
2N	Elbow	1
3N	Short Collar	2
4N	Long Collar	2
5N	Elbow Packing	1
6N	Bolt 6x20	1
7N	Nut 6mm	2
8N	Nut	2
9N	Air Cleaner Cover	1

Part	Description	Qty.
10N	Air Cleaner Element Assembly	1
11N	Grommet	1
12N	Outer Filter	1
13N	Element	1
14N	Base	1
15N	Air Cleaner Assembly	1
16N	Cover	1
17N	Screw	2

Diagram N - Air Cleaner



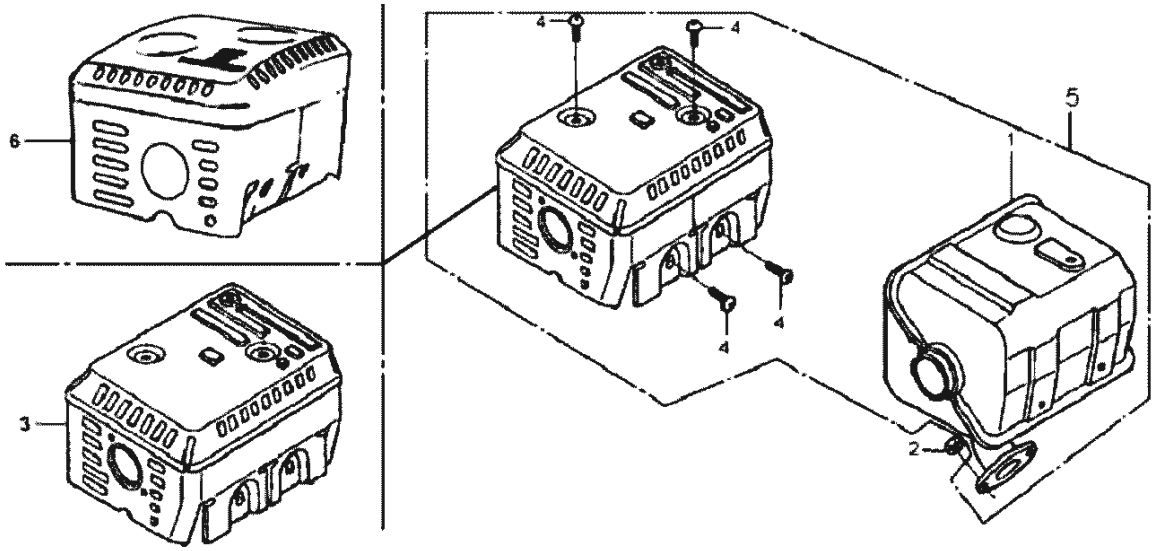
Note: When ordering replacement parts from this diagram, use the suffix “N”.

Parts List P - Muffler

Part	Description	Qty.
1P	Muffler	1
2P	Nut 8mm	1
3P	Muffler Cover	1

Part	Description	Qty.
4P	Screw 5x8	4
5P	Muffler Assembly	1
6P	Muffler Case	1

Diagram P - Muffler



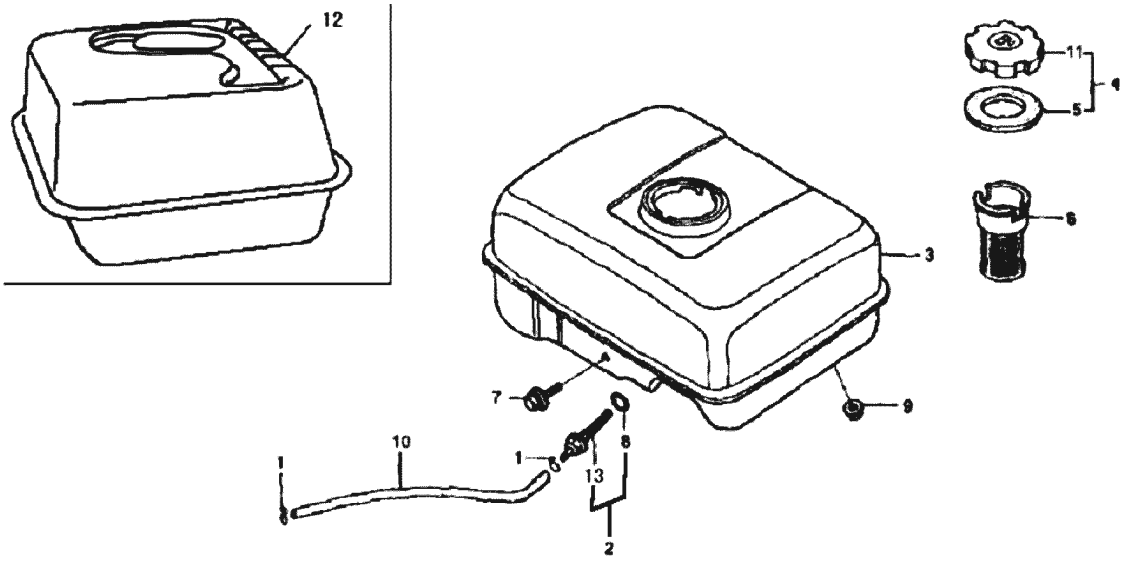
Note: When ordering replacement parts from this diagram, use the suffix “P”.

Parts List R - Fuel Tank

Part	Description	Qty.
1R	Clip Tube	2
2R	Joint Assembly	1
3R	Fuel Tank	1
4R	Fuel Filler Assembly	1
5R	Fuel Cap Gasket	1
6R	Fuel Strainer	1
7R	Bolt 6x25	1

Part	Description	Qty.
8R	Joint Packing	1
9R	Nut 6mm	2
10R	Fuel Line	1
11R	Fuel Cap	1
12R	Fuel Tank Assembly	1
13R	Adapter/Connector	1

Diagram R - Fuel Tank



Note: When ordering replacement parts from this diagram, use the suffix “R”.

3491 Mission Oaks Blvd. • PO Box 6009 • Camarillo, CA 93011 • 1-888-866-5797